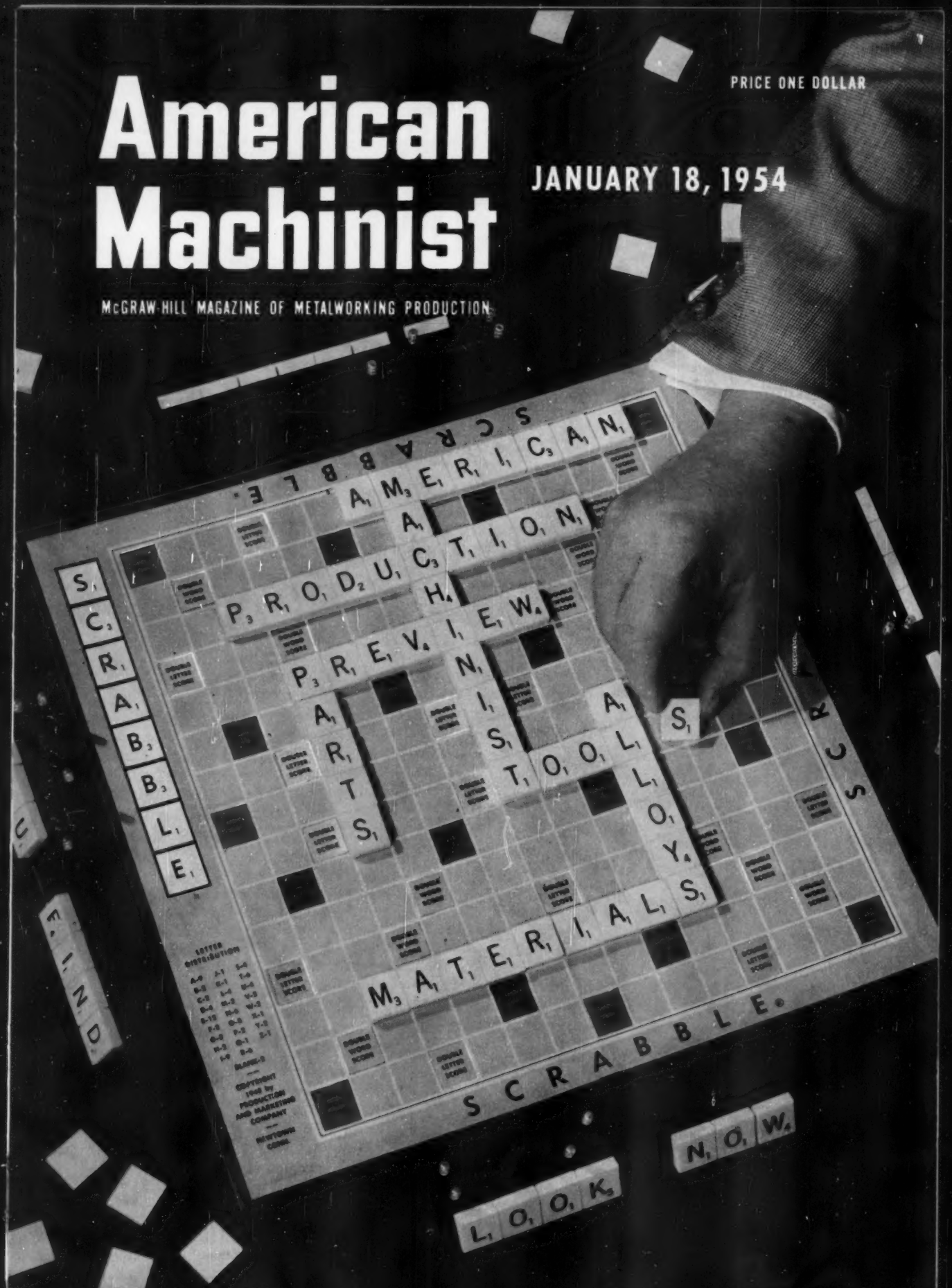
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American Machinist
JANUARY 18, 1954
McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION
SCRABBLE
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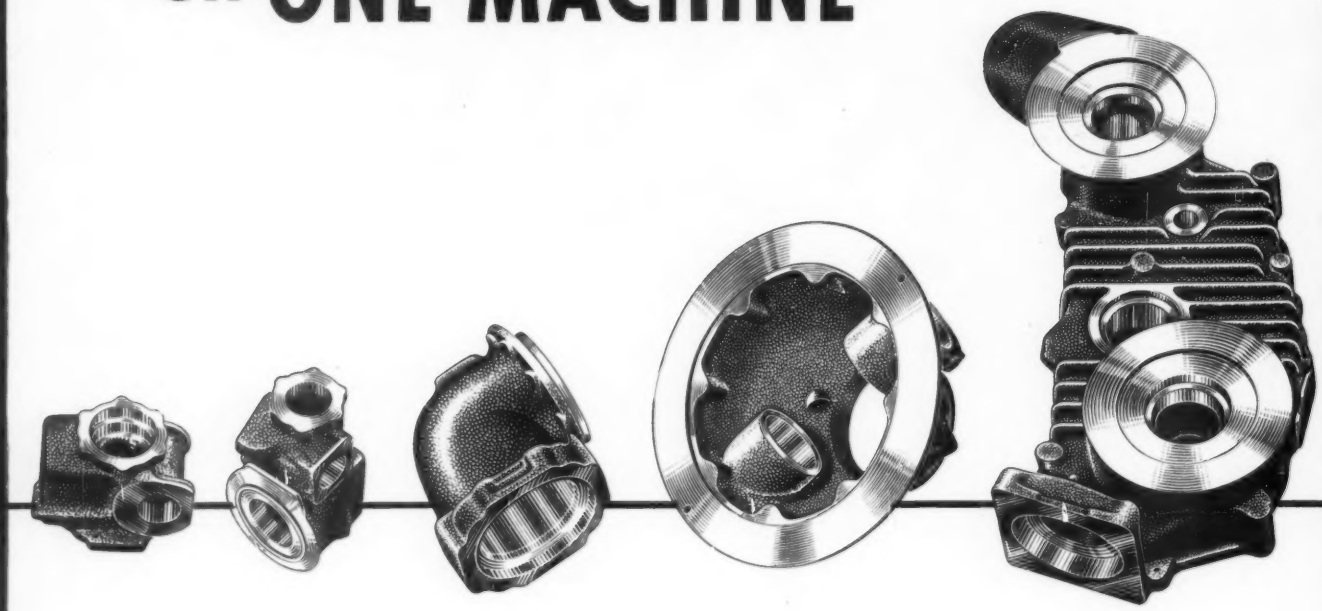
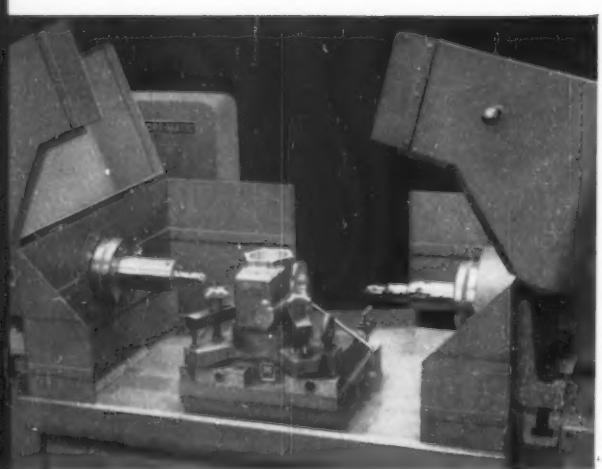
How to raise a family of five on ONE MACHINE





● On long-run production jobs, the speed, precision and economy of Heald Borizing has become almost a tradition. But what about short-run work on a variety of parts? Here, too, the versatile Heald Bore-Matic can give you faster, better production, at lower cost per part!

Here's a typical example. The Model 322 Bore-Matic shown at the left finishes FIVE different jet engine parts — each with a different fixture and tooling setup. Interchangeable fixtures are platen or angle plate type, as required. In some cases, adapters are used to permit one fixture to accommodate more than one part. Aligning rails help to locate the different fixtures quickly and easily. Both roughing or semifinishing and finishing are done with maximum speed and economy on this one Heald machine.

Long Runs or Short — when it comes to precision finishing, it pays to come Heald.

Internal and Rotary
Surface Grinding Machines
and Bore-Matics

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American Machinist

MAGAZINE OF METALWORKING PRODUCTION

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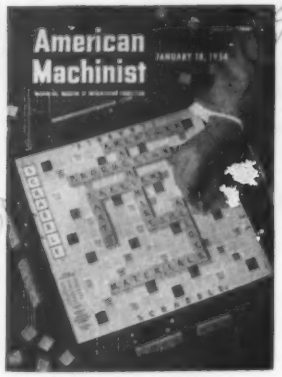


chips

SCRABBLE . . . The current parlor-game phenomenon, "Scrabble," provides an appropriate cover for our current Production Preview. Both are "hot" news. The game was invented some years ago, copyrighted in 1948 and marketed the same year—and was *no* sensation. But for the past year it has been big news, with the makers unable to keep up with the demand. A blend of crossword puzzles and Anagrams, it is adaptable for one to four people. Pictured on our cover is the deluxe version, which retails at $10—if you can find it.

50% INCREASE . . . About 50% more than last year's 1200-plus descriptions are included in this Production Preview. The grand total is 1861 items—all of which were previously published at greater length in our regular 1953 issues and are here reproduced as summaries. They give you a condensed catalog of what is new in metalworking equipment, materials and parts, the editors' selections from manufacturers all over the country. Items are republished here, classified by type, so you have under each heading a summary of what's new. With accompanying advertising, it provides a compact catalog for your guidance all during 1954.

BIGGEST . . . Not only is this our largest review to date, but also the largest compilation of newly available equipment, parts, and materials ever made, to our knowledge. It thus behooves you to save it for use all through this year. Keep it where you can get it quickly by just reaching.

STATISTIC . . . Our indexer tells us we had 1827 articles in 1952, as compared with 951 in 1951 and 916 in 1950. That looks again like a record—double the value for your money. We also had 382 different authors in '52, as compared with 368 in '51. The 1953 statistics are not yet available—takes time to get 'em worked out—but we predict they'll be up again.

HOBBIES . . . The "new-found leisure" they write about in the general magazines is relatively rare in an editorial office, but we do have editors who: collect first editions of T S Eliot, build compact radios, paint in oils, whittle, direct and act in amateur dramatics, repair and shoot muzzle-loading pistols, attend "first nights" of Broadway shows, play chess, and take pictures. There's only one golfer, two bowlers, a couple of sailors, and an archer. Writing gets to be a hobby, too.

INDEX, TOO? . . . This issue annually requires much concentrated editorial work just before and during the holidays, including incorporation of descriptions from our second December issue. We've sometimes thought it might also be helpful to have the index of the preceding year's general articles in the same issue. That would really snarl up the holidays! Would it be of corresponding help in unsnarling your reference to *AM*?

COMING . . . *AM* for Feb 1 will have a lead story on making hf contacts of beryllium copper, a Special Report on tool versatility, articles on belt grinding of carbides, on motor-part gaging, on mutual hiring for small plants, and another in the Stanley Cope series.

MAESTRO . . . Born in New Mexico, public schools in Florida, and college in New York—that's the early life of Jack Merriam, our itchy-footed editor of the "New Shop Equipment, Parts & Materials" department. He has his Bachelor of Science in Engineering from Columbia, plus a Master's in mathematics from Teacher's College there. Two years of teaching math and science in a trade school, then three years teaching engineering at Manhattan College and two years as a research engineer at Norden Labs was interspersed with Navy time as asst engrg officer on a sister ship to that of "Mr Roberts". Jack came to us almost a year ago and is directly responsible for this record-breaking Production Preview.

2 New GLEASON TESTERS

For COMPLETE CHECKING ✓ of Small Gears

NO. 104 SPUR GEAR TESTER
for spur, helical, and internal gears up to 4½" center distance.

✓ *A ROLLING TEST for composite error, recorded in chart forms.*

✓ *A RUNNING TEST under actual operating speeds and loads.*

For complete inspection of all small gears, use both types of test. The recorded rolling test shows an exact measurement of total error, including profile, spacing, and eccentricity effects. The power running test shows how the gears perform under actual operating conditions, and permits visual inspection of tooth contact pattern.

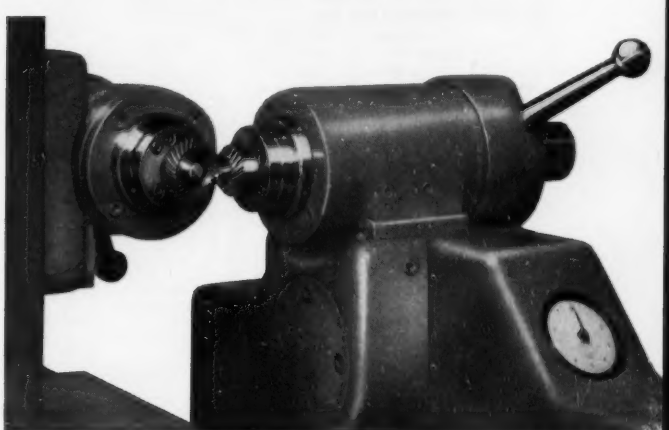
Note these provisions for making both types of check *on the same tester:*

For the RECORDING TEST

- 1/50 HP drive at 7.2 RPM
- Pressure between gears adjustable by 4 oz. increments, up to 5 lbs.
- Detachable electronic recorder with 5-stage variable magnification

For the RUNNING TEST

- ¼ HP drive
- Drive spindle speeds up to 14,000 RPM
- Precise load control by electric braking



NO. 104 ANGULAR HYPOID TESTER
for bevel and hypoid gears up to 4¼" diameter.

***WRITE FOR FULL INFORMATION** on how these new testers will improve your small gear inspection.*

GLEASON WORKS
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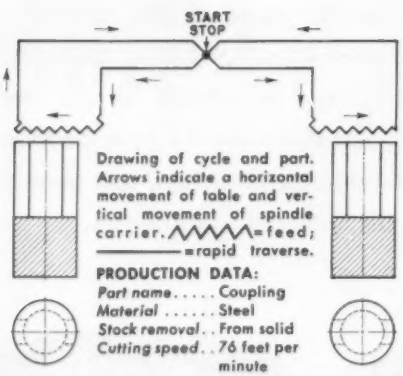
GLEASON

rapid traverse and feed

. . . right, left, down, rapid up

. . . *any combination automatically*

these setup requirements
are routine for NEW
CINCINNATI No. 2-24 automatics

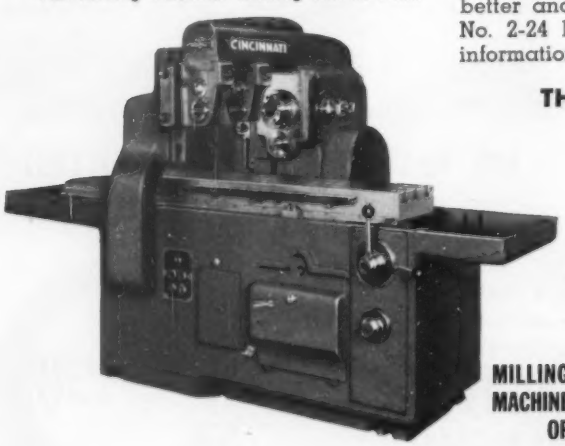


Drawing of cycle and part. Arrows indicate a horizontal movement of table and vertical movement of spindle carrier. ∧∧∧∧ = feed; ——— = rapid traverse.

PRODUCTION DATA:

Part name . . . . . Coupling
Material . . . . . Steel
Stock removal . . From solid
Cutting speed . . 76 feet per minute
Feed . . . . . 3½ inches per minute (one cut)
Production . . . . 112 Couplings per hour

CINCINNATI No. 2-24 Plain Automatic Rise-and-Fall Milling Machine. Catalog No. M-1760.



Complex designs beget complex parts. This modern-day phenomenon of complexity has been happening to products of all types, from toys to jet engines. Machining operations are likewise becoming more complex, requiring many of the latest CINCINNATI developments in machining, such as 360° automatic tracing; high-speed carbide broaching; "twist" milling; automatically synchronized horizontal and vertical milling. ¶ The equipment illustrated here, a CINCINNATI No. 2-24 Plain Automatic Rise and Fall Milling Machine, performs operations of the latter type; the automatic cycle circumscribes a box-shaped figure. The milling operation itself, mill ½" slot 1⅝" deep in couplings (see part drawing), is rather simple, but to keep the cost at the very lowest, Cincinnati Application Engineers chose the rise-and-fall style machine, and equipped it with two three-station hydraulic clamping fixtures. The machine table feeds to the right and left, an advantage arising from the machine's Automatic Backlash Eliminator. To jump over obstructions in the fixture, the spindle carrier rapid traverses up and down. An automatic stop position at the center of the cycle provides complete safety for the operator. ¶ Whether your milling operations are simple or complex, you can do them better and at lower cost on a CINCINNATI. For brief data on the No. 2-24 line, look in Sweet's Machine Tool Catalog. Complete information may be obtained by writing for catalog No. M-1760.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

CINCINNATI **CINCIN**

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

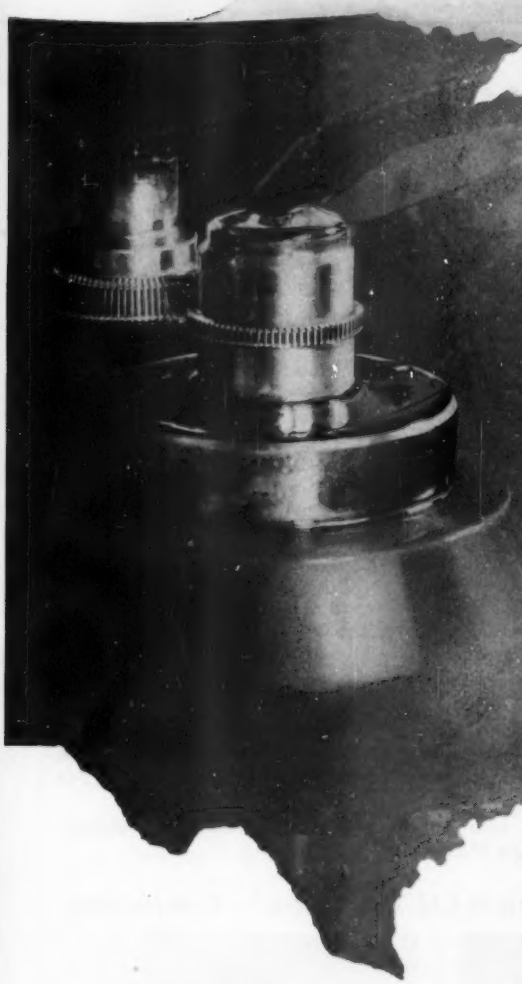
CINCINNATI No. 2-24

Plain Automatic Rise-and-Fall Milling Machine tooled up to mill a deep slot in couplings. A sample coupling is shown on the right-hand fixture.

Here, too, GEAR
BOEING
DOUGLAS
N
A
A
NORTHROP
HUGHES
CONVAIR
THE

QUALITY IS MAINTAINED

by THE FELLOWS METHOD



- *Fine-Pitch and Other Gear Shapers*
- *Shaving Machines*
- *Original Fellows Cutters*
- *Involute Inspection Instruments*
- *The "Red Liners"*
- *Lead Checking Instruments*
- *Master Gears, etc.*

The precision standards for fine-pitch instrument gears and for control system gearing in the Aviation Industry, are well served by the control of accuracy *inherent* in the Fellows generating principle.

Fellows machines and tools have demonstrated *here*, as in other industries, their ability to hold costs under control and to work within the most critical tolerances.

For advice on methods, machines, or specific production problems, call on the nearest Fellows office.

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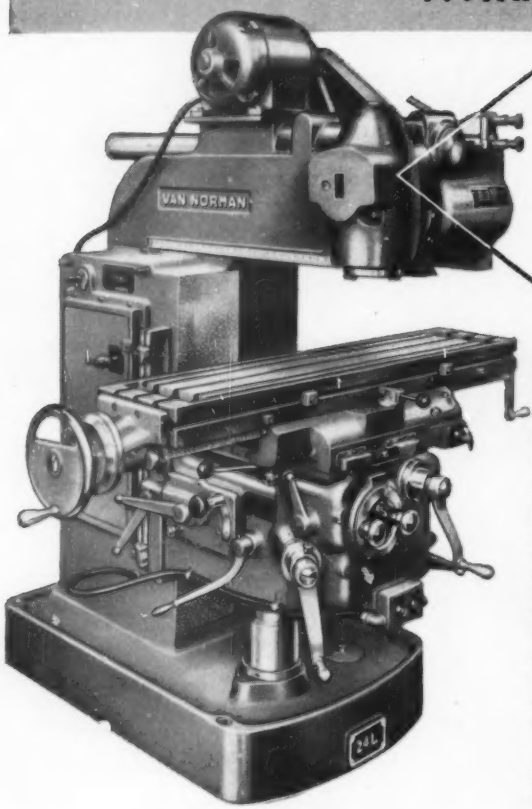
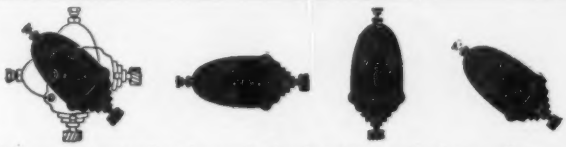
New 10 MODELS VAN NORMAN Ram Type Milling Machines

Providing Maximum "Flex-Ability" and "Cut-Ability" ...Will REDUCE Milling Costs!



No. 24L shown is 1 of 10 new models



Adjustable cutterhead permits horizontal, vertical as well as angular milling on one machine.

Van Norman Plus Features

"Flex-Ability" is increased with the *new*, improved heavy-duty adjustable cutterhead which has 90° adjustment . . . permits horizontal, vertical as well as angular milling.

"Cut-Ability" is increased with the *new* box type column, with its heavier and wider cross sections whose internal ribbing provides utmost rigidity. This generous ribbing provides maximum strength, assuring rigid support for the extra long ram, as well as the heavy knee.

"Cut-Ability" is increased with the *new* heavy motorized knee. The direct drive feed motor is mounted on the knee. The 10 models provide a selection of horsepower from 3 to 10.

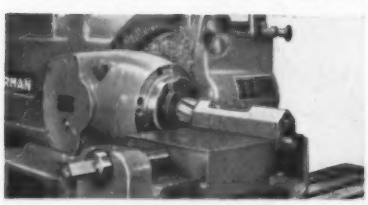
"Flex-Ability" is increased with the *new* extended, large, heavy-duty ram, which increases the capacity of the miller . . . permitting maximum cuts over the entire ram range to the full capacity of the motor.

"Cut-Ability" is increased with the *new* heavy knee, saddle and table assembly . . . designed as a unit to provide maximum rigidity and accuracy.

"Flex-Ability" is increased by the spindle motor that drives cutterhead only . . . permits every type of milling with all types of cutting tools.

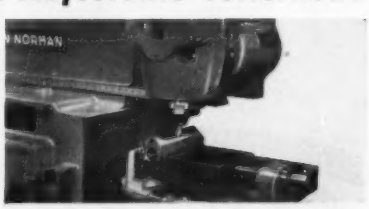
Write for more information about these new Van Norman Ram Type Milling Machines.

Maximum "FLEX-ABILITY" with the VAN NORMAN Adjustable Cutterhead



A typical horizontal milling operation performed on the new Van Norman Ram-type Miller.

An angular milling operation performed on the same work piece. Note work piece remains in the same set-up. Angular range of cutterhead 0°-90°.

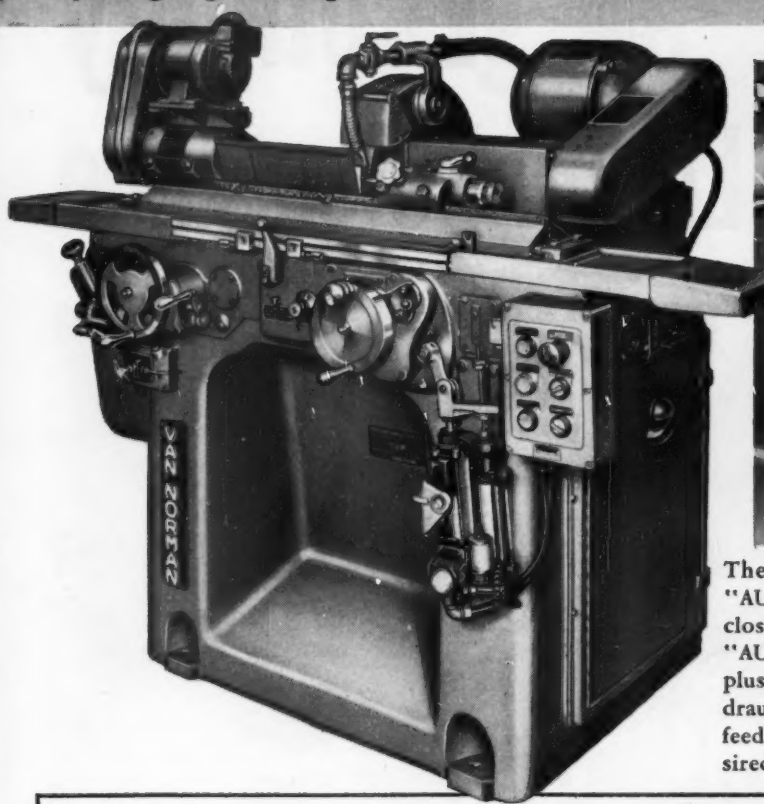


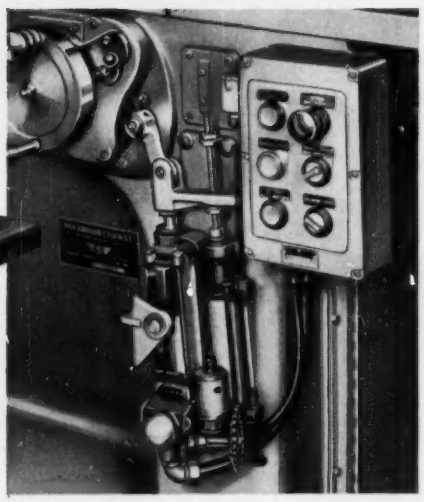
With the cutterhead locked in vertical position a slot is milled in the work piece. Note the set-up has not been changed.

VAN NORMAN — manufacturers of — Ram and Column Type Milling Machines, Cylindrical Grinders, Spline Grinders, Oscillating Radius Grinders, Special Production Grinders, Centerless Grinders.

New "AUTO-CYCLE" INFEED ATTACHMENT

provides Completely Automatic cycle for plunge grinding on Van Norman No. 418 Cylindrical Grinders





The Van Norman No. 418 Grinder with "AUTO-CYCLE" is your answer to today's close tolerance grinding requirements. With "AUTO-CYCLE" the No. 418 will repeat to plus or minus .0001". "AUTO-CYCLE" is hydraulically and pneumatically controlled. Fine feed is easily and quickly adjusted to the desired rate.

Plus Features on the No. 418 Grinder

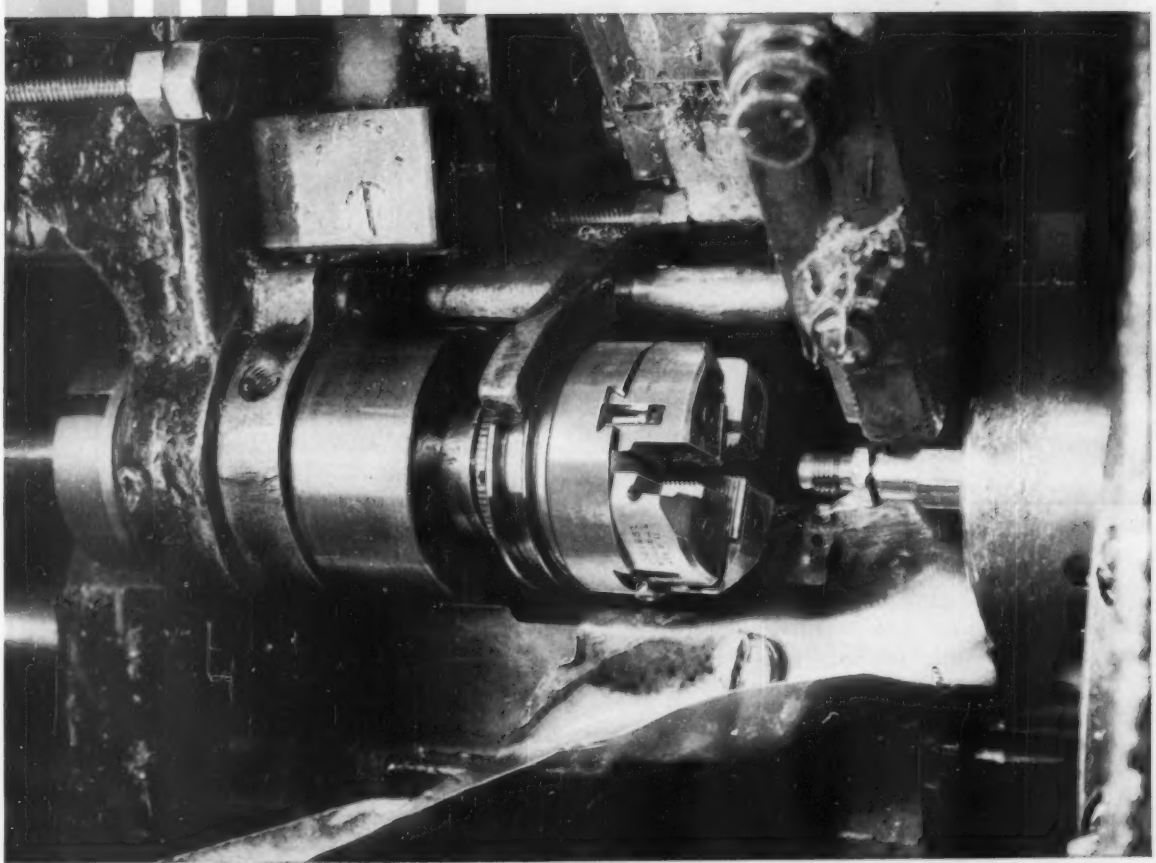
- Wheel spindle is of unit type construction — totally enclosed with double row precision cylindrical roller bearings, proved on thousands of Van Norman Grinders, assuring maximum accuracy and long operating life.
- Heavy-duty headstock and footstock for rigidity, accuracy and smooth grinding.
- Automatic starting and stopping of headstock and table traverse.
- Rugged base, with wide table bearing ways. Separate motor drives for wheel spindle, table and headstock.
- Controls are conveniently grouped in front of grinder for ease of operation.
- One-shot metered lubrication for all bearing surfaces on ways.
- Capacity 4" x 18". Can be purchased with or without "AUTO-CYCLE".

Write for complete information. Ask for prices. They're remarkably low for such high quality equipment.

VAN NORMAN COMPANY, Springfield 7, Massachusetts

LANDIS

Economy
Limited Clearance



Threading On Automatics....

To assure economy threading on automatic screw machines where limited die head clearance is a major factor Frank H. Wilson Co., Inc. in Detroit, Michigan use the ½" LL LANDEX Head. Applied to one of their small Acme-Gridley's for threading tubing nuts this head cuts ½", 20 pitch UN threads ⅜" in length on B1113 screw stock to a class three fit. An average of 20,000 pieces are threaded between chaser grinds.

Compactly designed with only a 2 7/16" swing the ½" LANDEX will thread all diameters from #4 to ½". A minimum number of working parts made of hardened and ground alloy steel, chaser holders designed to eliminate warpage and springing, and the use of precision LANDIS Tangent Chasers - - - all contribute to the high degree of rigidity and accuracy of this LANDEX Head.

Compare the chaser lengths in the illustrations and note the long life this LANDIS User has received from the chasers used in this application. These chasers will still produce thousands of threads as (1) LANDIS Tangential Chasers are usable for 80% of their original length; (2) only a few thousandths of metal need be removed from a chaser when regrinding; (3) when regrinding the same amount of metal need not be removed from each chaser; (4) long chaser life is received between grinds. These are the basis for economy in any threading operation.

For further information on this LANDEX Head and on other LANDIS Heads using Tangential Chasers and designed for all types of thread-cutting operations write for Bulletins F-80 and F-90. Please send specifications when writing.

THE WORLD'S LARGEST MANUFACTURERS OF THREAD GENERATING EQUIPMENT

395-C

THE LANDIS *Machine* CO. WAYNESBORO PENNSYLVANIA

Eliminates Extra

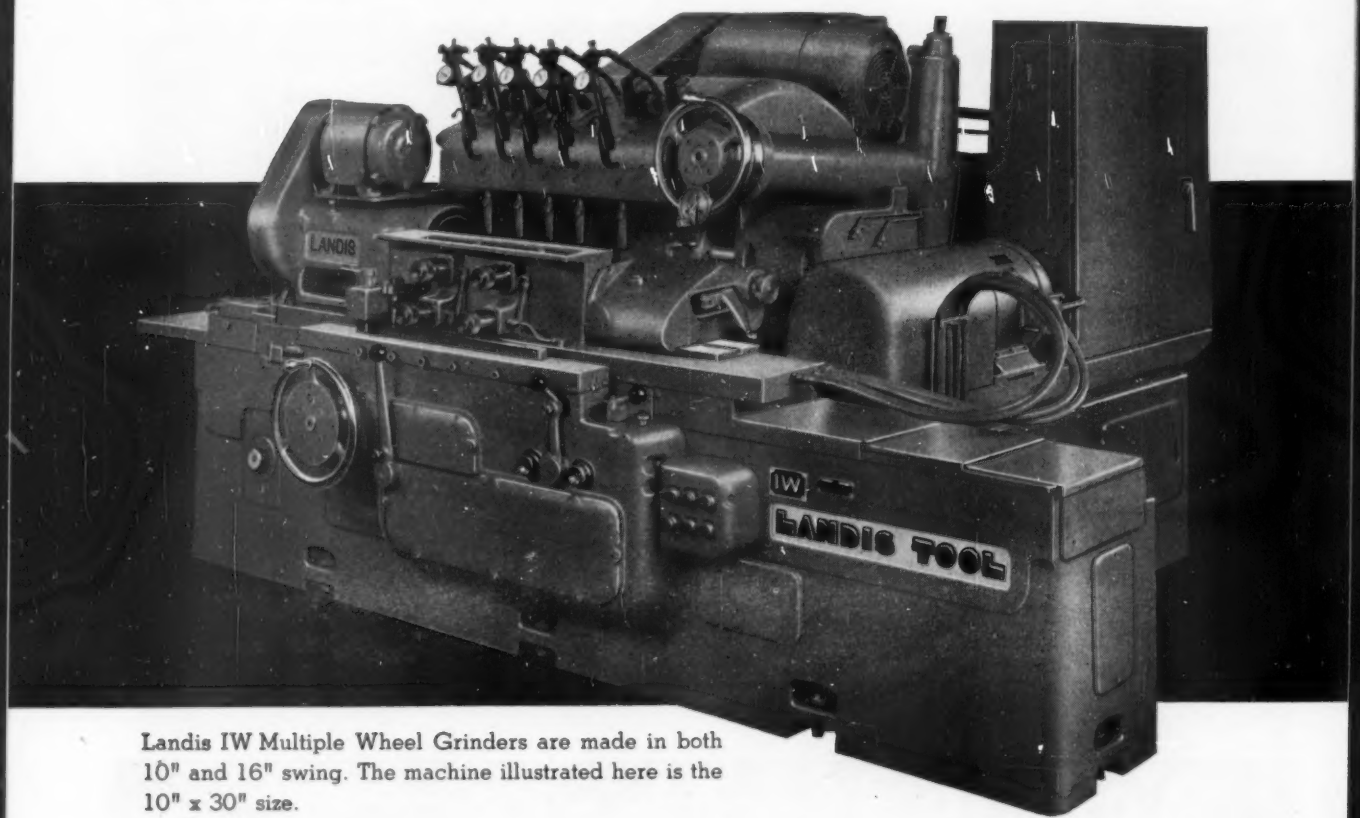
How Landis Multiple Wheel Grinders Reduce Precision Grinding Costs

Less Investment One IW replaces two or more conventional cylindrical types.

Less Grinding Time Any number of different concentric diameters ground in one operation with semi-automatic cycle.

Less Setup Time A single setup on the IW instead of two or more setups on the machines which the IW replaces.

Less Work Handling Only one loading and unloading operation. No moving work from one machine to another.



Landis IW Multiple Wheel Grinders are made in both 10" and 16" swing. The machine illustrated here is the 10" x 30" size.

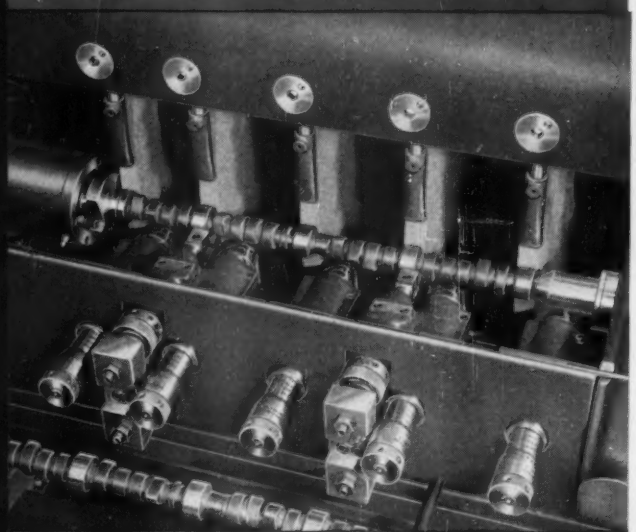
LANDIS

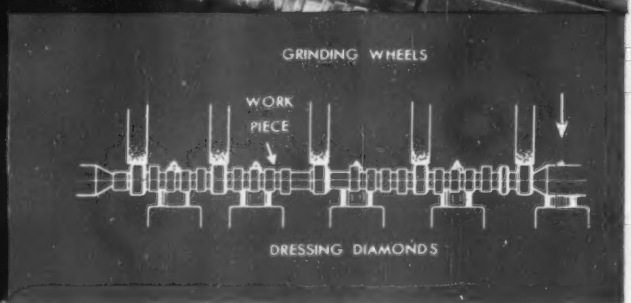
precision grinders

Grinding Operations

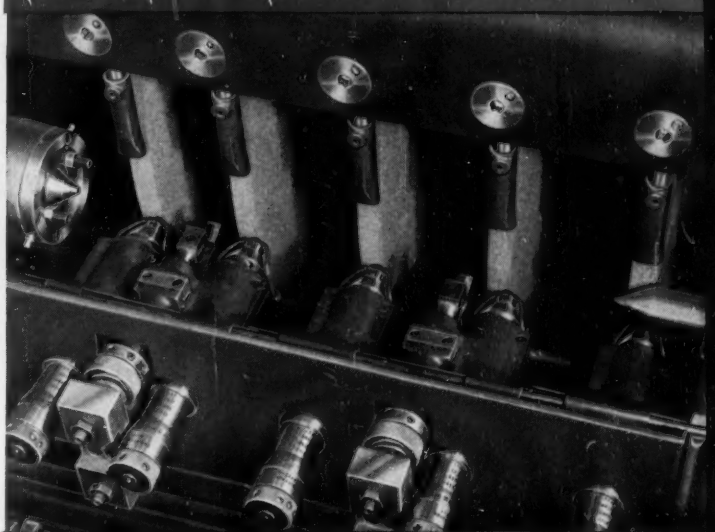
Grinds Five Diameters Concentric In One Operation

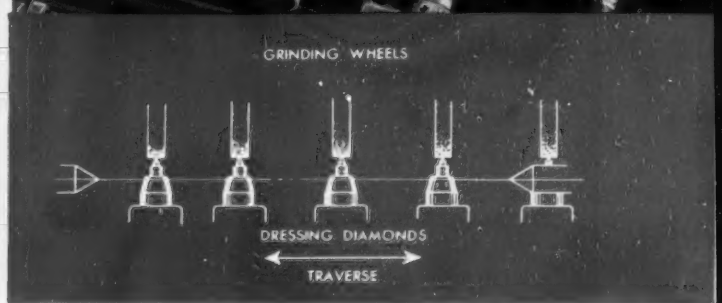
This is the finish grinding operation on the 5 line bearings of a V-8 camshaft. Stock removal is .009" to .010" and production is 60 shafts per hour. All bearings are finished in one operation.



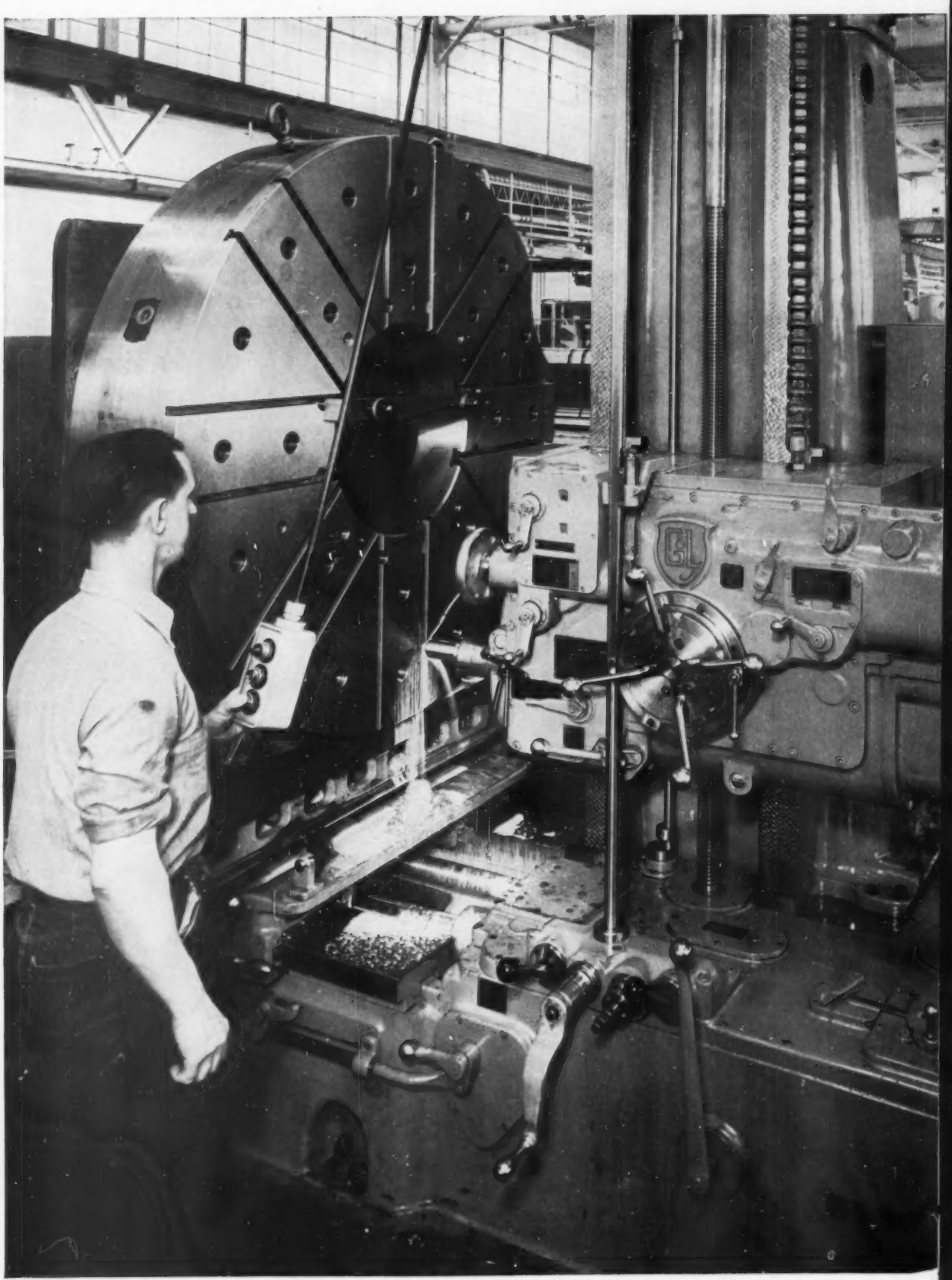


Unique method of dressing straight wheels. Saves time and insures accuracy with individually adjustable diamond positioning. Double jet cooling on each diamond. Dresser always in position.





LANDIS TOOL COMPANY / WAYNESBORO, PENNA., U.S.A.



20-ton aspirin...

to end production headaches!

This versatile machine helps you eliminate problems of overly long floor-to-floor time . . . frequent, complicated setups...and expensive re-runs on close tolerance work. It's the G & L 30-Series table type Horizontal Boring, Drilling and Milling Machine

For either long production runs or custom jobs, G&L 30-Series machines offer you many advantages to speed work, cut costs and increase shop flexibility. They feature an unusually wide range of speed and feed selections, extreme rigidity and accuracy, plus easy, positive control.

In addition, for special jobs or special problems, they are available with a host of attachments and accessories. Any one piece of optional equipment may help you turn a previously losing proposition into a real profit-maker. This equipment includes: an Automatic Electric Positioning Device, built-in or separate revolving tables, angular milling attachments and continuous feed facing and boring heads.

G&L table type machines are available with 3, 4, 5, 6 and 7 inch diameter spindles. Any model is available in a choice of four basic table and saddle arrangements in various sizes. For complete details on these cost-cutting, work-speeding machines, see your G&L representative or write —

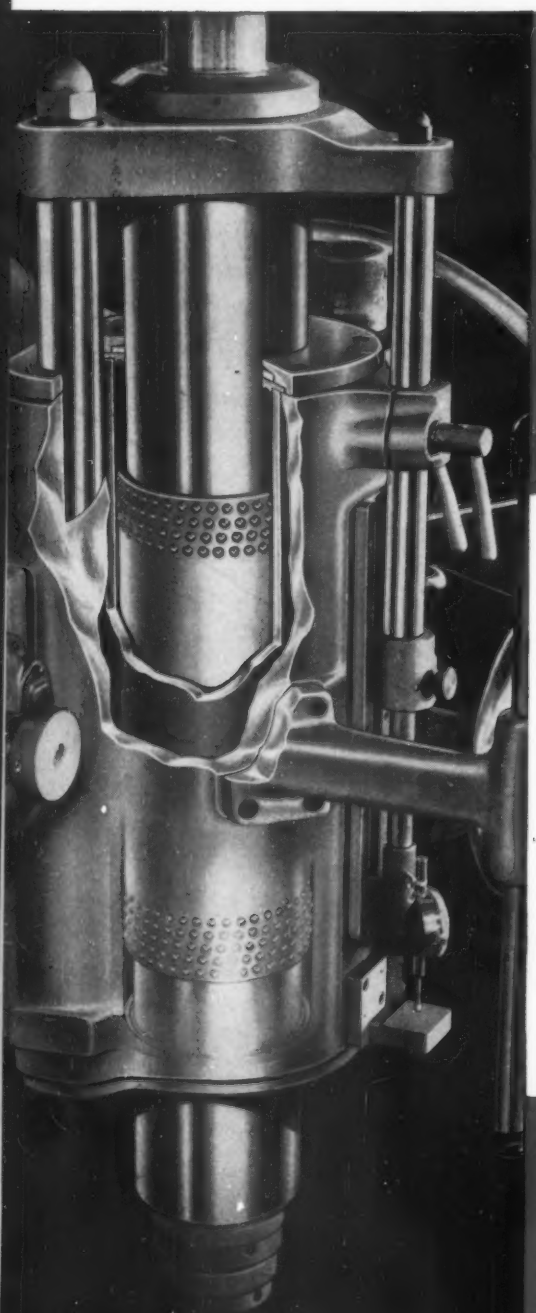
GIDDINGS & LEWIS MACHINE TOOL CO.

FOND DU LAC, WISCONSIN

Builders of the world's finest heavy-duty machine tools — Horizontal Boring, Drilling and Milling Machines — table, floor and planer types; Hypro Double Housing and Openside Planers; Planer Type Milling Machines and Vertical Boring Mills; and Davis Cutting Tools

ACCURACY to "TENTHS"

Indefinitely ...



THANKS TO THE *Exclusive* PRECISION PRELOADED *Ball Roll Quill*

Conventional jig borers — with the usual, plain slide bearing, quill construction — demand frequent, skilled maintenance for accurate operation. This trouble, down-time and expense is eliminated by the exclusive Pratt & Whitney Ball Roll Quill Spindle Head. Rigidity and the exceptionally high original accuracy are retained indefinitely; you can be sure of precision to "tenths" at all times

The Quill Bearing is a hardened steel liner, deep frozen and precision lapped in place. The quill . . . hardened precision ground and draw polished . . . "roll-feeds" on 360 specially selected, super-precision balls. Preloaded between the hardened quill and liner, they provide a total bearing pressure of over 8,000 pounds. Friction and wear are minimized and the up-down movement is highly sensitive for small-hole hand operation.

The P&W Ball Roll Quill spindle also adds far greater versatility. Ability to resist heavy lateral pressures without deflection or wear has made it practical to provide the table and carriage of the 4E Jig Borer with power feeds. This makes it possible to perform precision milling in addition to the usual boring operations.

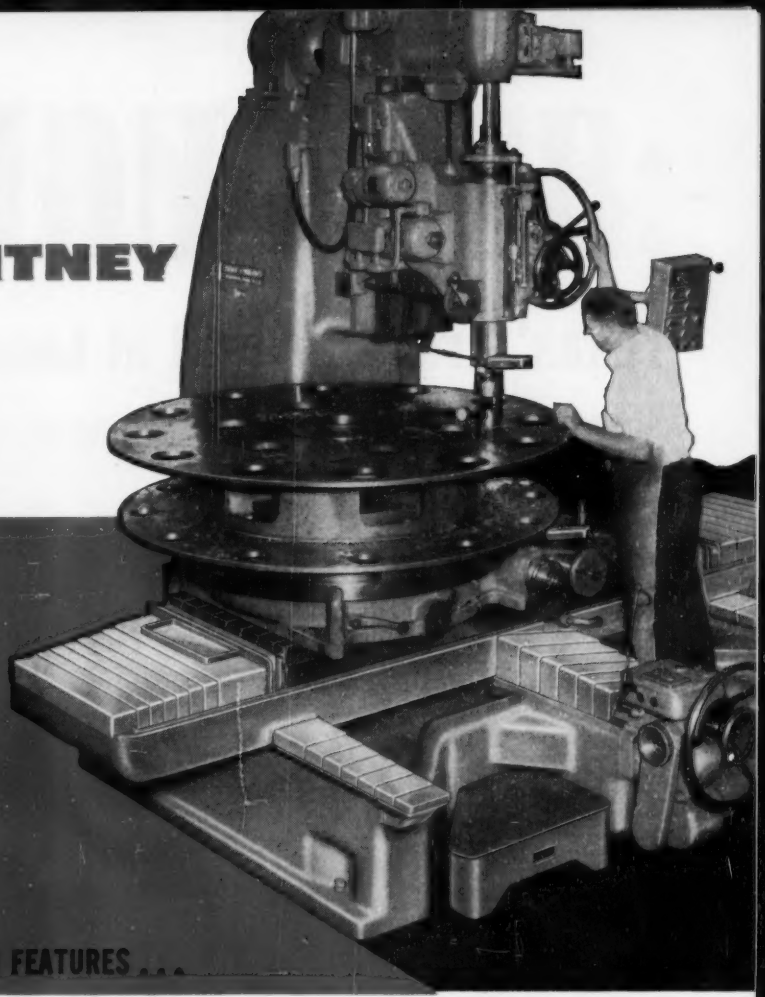
DESIGNED, ENGINEERED and MANUFACTURED THROUGHOUT TO MEET TODAY'S DEMAND for FINER ACCURACY, GREATER VERSATILITY, BIGGER CAPACITY and INCREASED SPEED and EASE OF OPERATION

Yours with a

PRATT & WHITNEY

NUMBER **4E**

Electrolimit JIG BORER



WITH THESE ADDITIONAL OUTSTANDING FEATURES . . .

• THE NEW P&W *Electrolimit* MEASURING SYSTEM

This entirely new method of locating the table is fast, extremely accurate, absolutely positive and easy to use. There are no contacting surfaces and, therefore, no wear; the original high accuracy is retained indefinitely.

• P&W OPEN SIDE CONSTRUCTION

A greater variety of irregular shapes and larger work sizes are handled with a speed, ease and convenience impossible with any other type of jig borer construction.

• LARGEST CAPACITY OF ANY JIG BORER BUILT

The big 36 inch by 72 inch table handles work loads up to a full 5,000 pounds. Longitudinal table travel is 60 inches; transverse travel is 36 inches. Maximum distance from table top to spindle end is 47 inches.

• CENTRALIZED PUSH-BUTTON CONTROL

All controls are readily accessible from a single operating position. Electric push-button controls for all motions plus speed and feed selectors are centralized on a single adjustable station.

Other PRATT & WHITNEY *Electrolimit* JIG BORERS

THE 1E — compact and versatile with table sizes of 12" x 24" and 12" x 42".

THE 2E — practical size for the average tool room with 22" x 44" table.

And now on the way — THE 3E — with 28" x 56" table.

PRATT & WHITNEY End Measure JIG BORERS

We will continue to manufacture this famous line. Featuring the same Ball Roll Quill spindle and the same high precision performance as the Series "E", they are equipped with End Measures instead of the *Electrolimit* Measuring System.

Circular No. 556

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND COMPANY
WEST HARTFORD 1, CONNECTICUT, U. S. A.

FOR COMPLETE INFORMATION send for 4E Circular No. 556. Write on your Company letterhead to the P&W Branch Office nearest you . . . or direct to West Hartford.

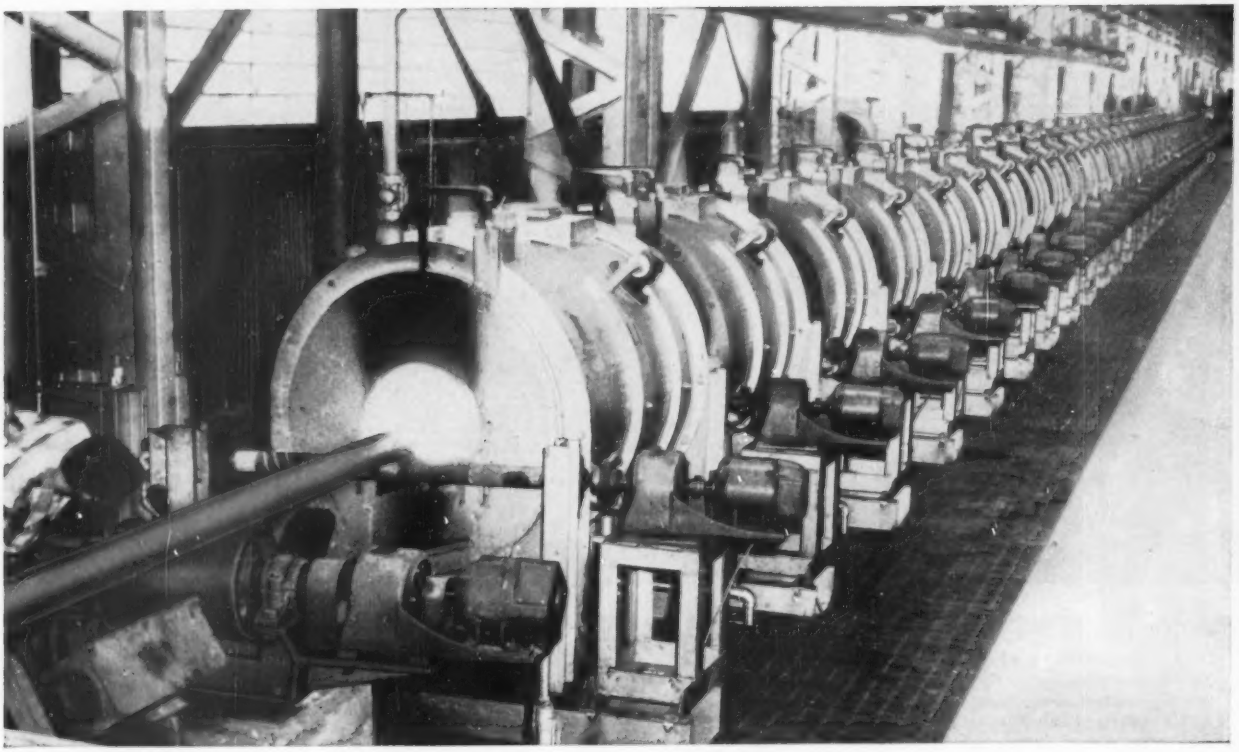
First Choice for Accuracy

BRANCH OFFICES . . . BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DALLAS (The Stanco Co.) • DETROIT • HOUSTON (The Stanco Co.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., WEST HARTFORD

MACHINE TOOLS • CUTTING TOOLS • GAGES

TOUGH JOB?

Texas' first pipe mill at Lone Star Steel chooses



As far as the eye can see—Link-Belt cast steel roller bearing pillow blocks and helical gear drive units on roller conveyors in No. 2 Pipe mill handling 6″ dia. pipe. No. 1 handles pipe up to 16″ dia. Link-Belt chains are used on cooling and transfer beds.

HIGH temperatures from heat-treating furnaces . . . heavy, continuous loads . . . frequent, severe impact. You'd have a hard time finding a tougher set of conditions for bearings. Yet that's exactly the combination encountered by the roller conveyor units in a pipe mill.

Three equipment manufacturers, who were awarded separate contracts for important conveying and handling equipment, independently specified Link-Belt bearings. This selection in all three cases was approved by the supervising engineers, A. J. Boynton and Company. Throughout the half-mile long production lines in Nos. 1 and 2 pipe mills, these rugged blocks with *cast steel housings* support the rolls and the pipe as it is formed, sized, straightened, threaded, tested, inspected, varnished and moved to yard storage

For your toughest shaft support jobs, it will pay you to investigate the possibilities of these self-aligning roller bearings housed in cast steel. You'll discover the features listed on the page at right are just a few of their outstanding advantages. Ask your nearby Link-Belt sales representative for complete information.

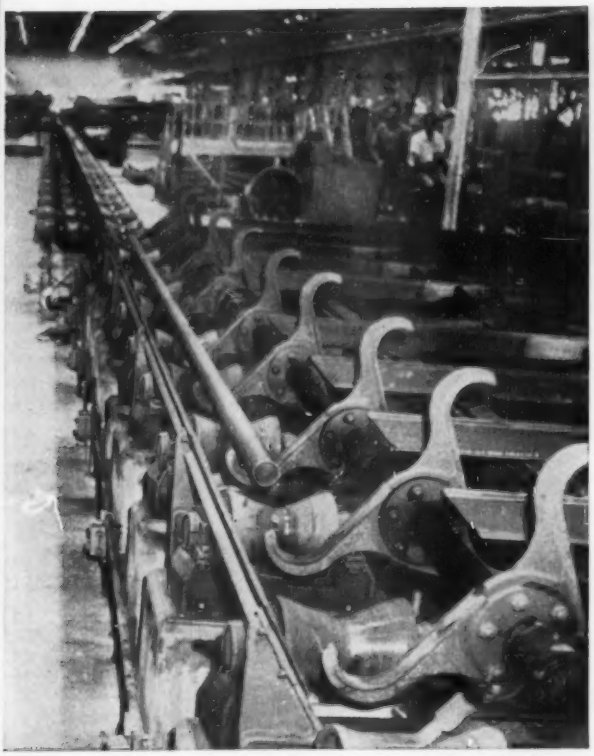
LINK-BELT

BALL AND ROLLER BEARINGS

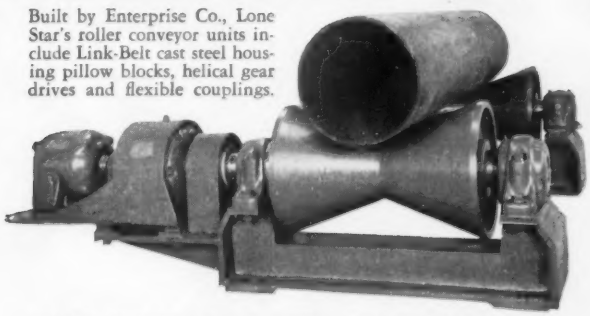
LINK-BELT ball and roller bearings keep company with

READY ANSWER:

LINK-BELT BEARINGS

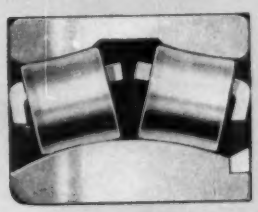


Built by Enterprise Co., Lone Star's roller conveyor units include Link-Belt cast steel housing pillow blocks, helical gear drives and flexible couplings.



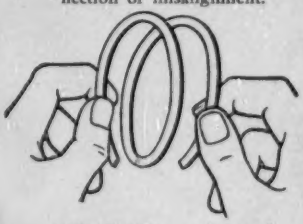
FACTS: for bearing users

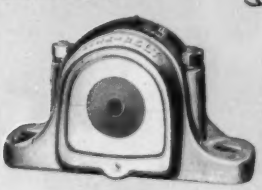
New Link-Belt Series LPK-6800-F Roller Bearing Pillow Blocks have rugged cast steel housings with removable caps for easy assembly and disassembly.



INTEGRAL SELF-ALIGNMENT. Concave rollers operate between convex raceways. Inner ring is true spherical element, free to turn in any direction without altering contact with rollers. Symmetrical rollers completely pocketed in retainers for accurate spacing and guiding. Long, care-free bearing performance is assured even with shaft deflection or misalignment.

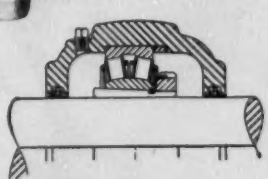
SPIRAL STEEL SEALS provide effective lubricant retention for either oil or grease. Housing sealing fully protects all moving surfaces which are centrally lubricated from a large, common reservoir.

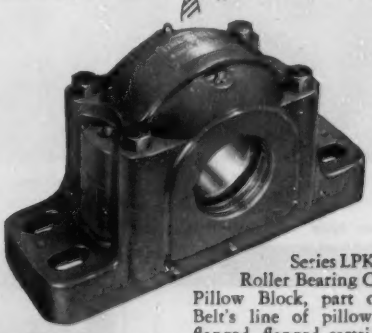




END PLATE can be used for protection where shaft terminates at the bearing. No added machining is necessary.

INCREASED COMPACTNESS is achieved with self-contained design. There are no external rotating parts to mar smooth appearance.

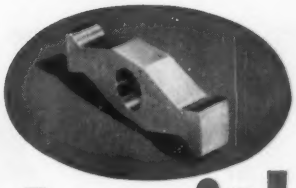


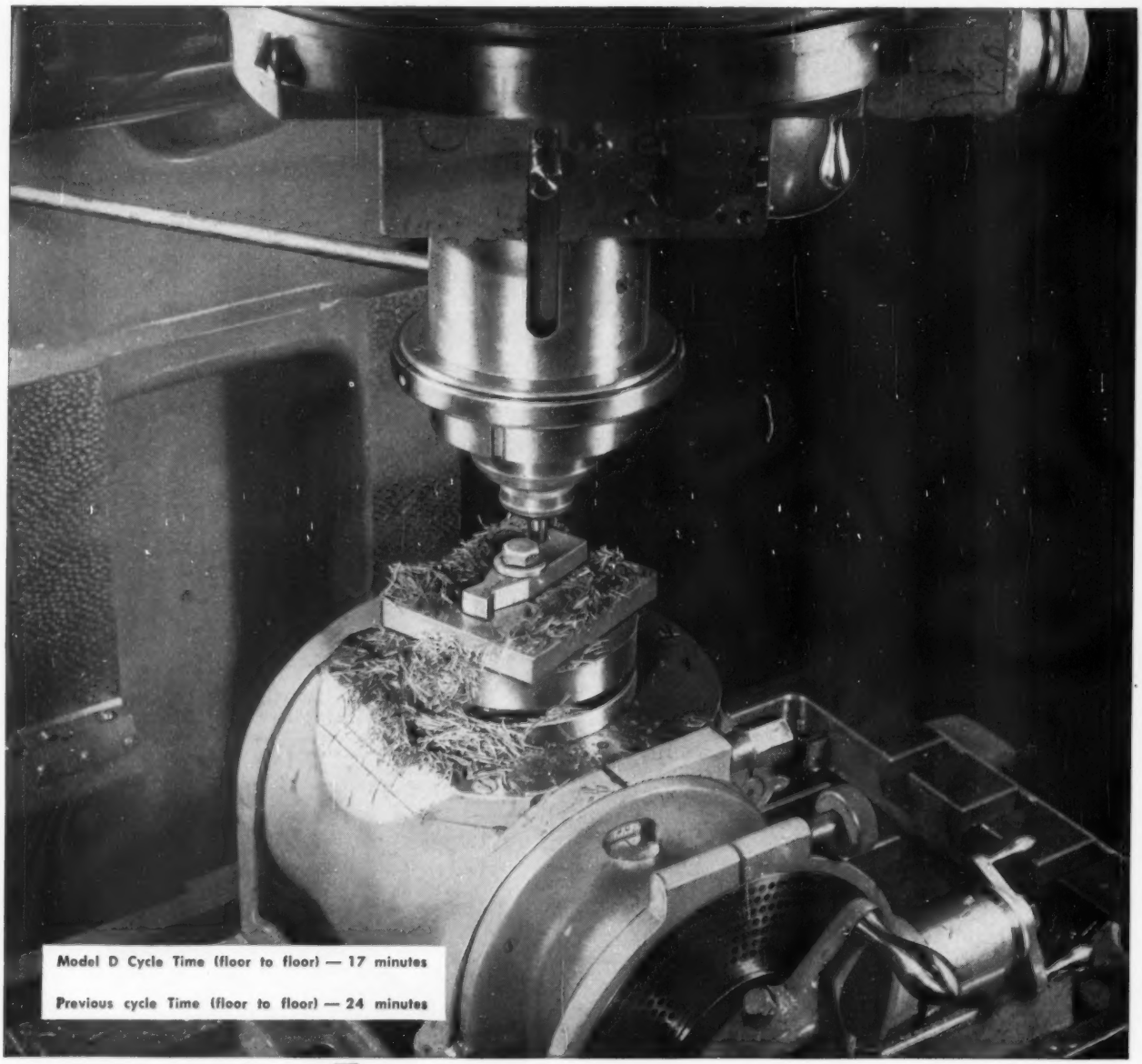


Series LPK-6800-F Roller Bearing Cast Steel Pillow Block, part of Link-Belt's line of pillow blocks, flanged, flanged cartridge, cartridge, take-up and hanger blocks and unmounted bearings.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices, Stock Carrying Factory Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13.381-BB

America's hardest-working machines

This part  is the blueprint, with a



Model D Cycle Time (floor to floor) — 17 minutes

Previous cycle Time (floor to floor) — 24 minutes

PRODUCTION DATA

Part	Control Valve Lever	**Spindle Speed**	530 rpm
Material	SAE 1020	**Lot Size**	50 pieces
Cutter	½ in. — 2-lip HSS End Mill	**Machine**	Model D

finish-milled direct from single setup, in 17 min.!

Kearney & Trecker Model 2D Rotary Head Milling Machine saves six hours on 50 piece run

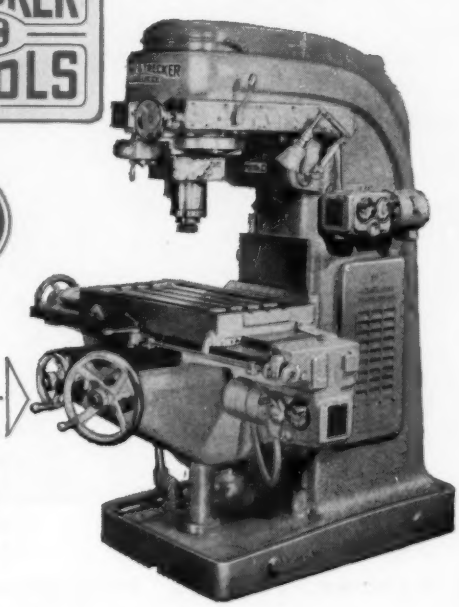
HERE is another example of the tremendous time and tooling savings possible with the rotary head milling method.

This manufacturer used to complete a control lever every 24 minutes. Now the same work is completed in only 17 minutes. . . . and no multiple setups or expensive form cutters are necessary. The blueprint is the only guide the operator needs — the machine's precise mechanical control of the cutter's angular and radial movements does the rest.

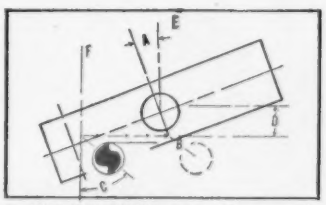
Here's the Rotary Head Milling Machine Production Idea Booklet. It contains several examples of how this method has been found exceptionally efficient in solving production, die, forging and metal pattern milling problems. It's yours for the asking.

Address requests to Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

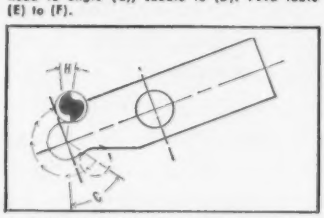
KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS



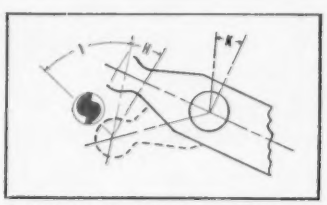
THIS IS THE MACHINE that will handle your light production milling faster, easier and at tremendous savings over any other method. If you have any production problems in plastic molds, die-casting, forging and stamping dies, or selected production milling operations — it will pay you to investigate the Model 2D Rotary Head Milling Machine.



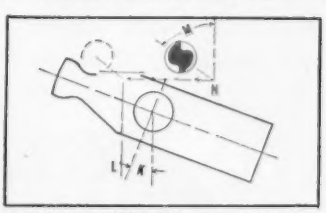
1. MILL 20° ANGLE. Index piece to angle (A), offset spindle slide to radius (B), set rotary head to angle (C), saddle to (D). Feed table (E) to (F).



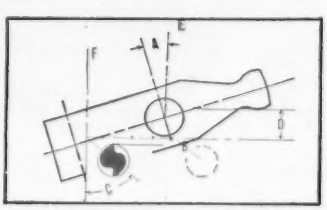
2. MILL .642/.645 DIAMETER. Rotate head angle (C) to angle (H).



3. MILL 1½ IN. RADIUS. Rotate head from angle (H) to angle (J), index dividing head from angle (A) (Oper. 1) to angle (K).



4. MILL 20° ANGLE. With piece at (K), move center of head to (L); rotate head to (M). Feed table (L) to (N).



5. MILL SAME FORM ON OPPOSITE END. Repeat operations 1 through 4 by indexing the workpiece to angle (A-Oper. 1).

Warner & Swasey's record

"ONLY ONE DAY'S DOWNTIME

THAT'S the report on two Warner & Swasey No. 3 Universal Turret Lathes at the Ralston, Nebraska, plant of Sensation Mower, Inc. And since their installation in 1946 these two highly versatile turret lathes have efficiently handled the entire metal turning requirements of the plant—over 40 different parts for mowers, snow removal equipment, and power floor polishers.

Mr. W. H. Phelps, Sensation Mower's President, says, "We are able to get the job done with these machines a lot faster than even your Field Engineer said we could."

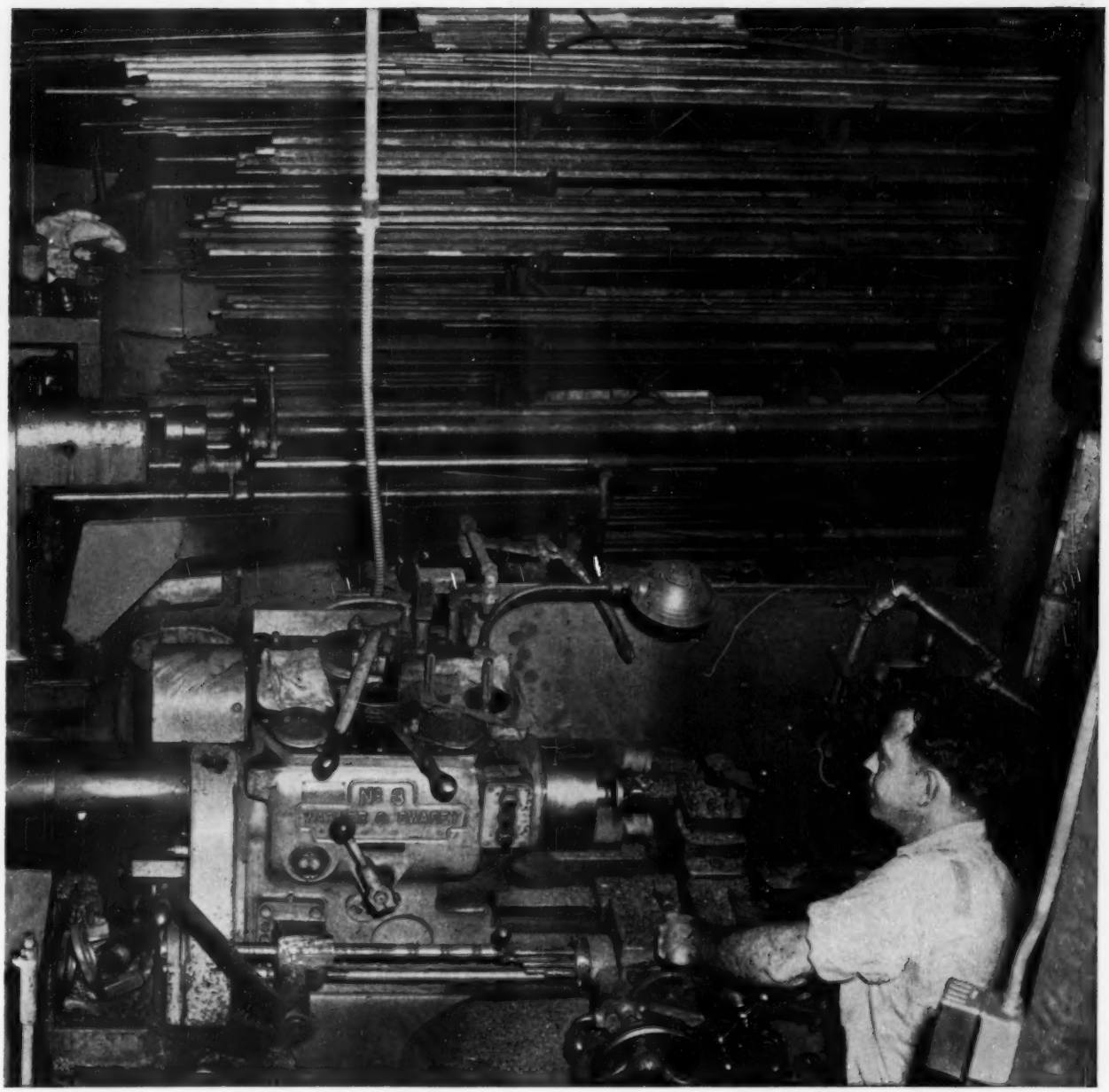
Yes, Warner & Swaseys are built to last—to give you dependable, high precision production with the very minimum of downtime and maintenance costs.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER &

at Sensation Mower, Inc.

IN SEVEN YEARS!"



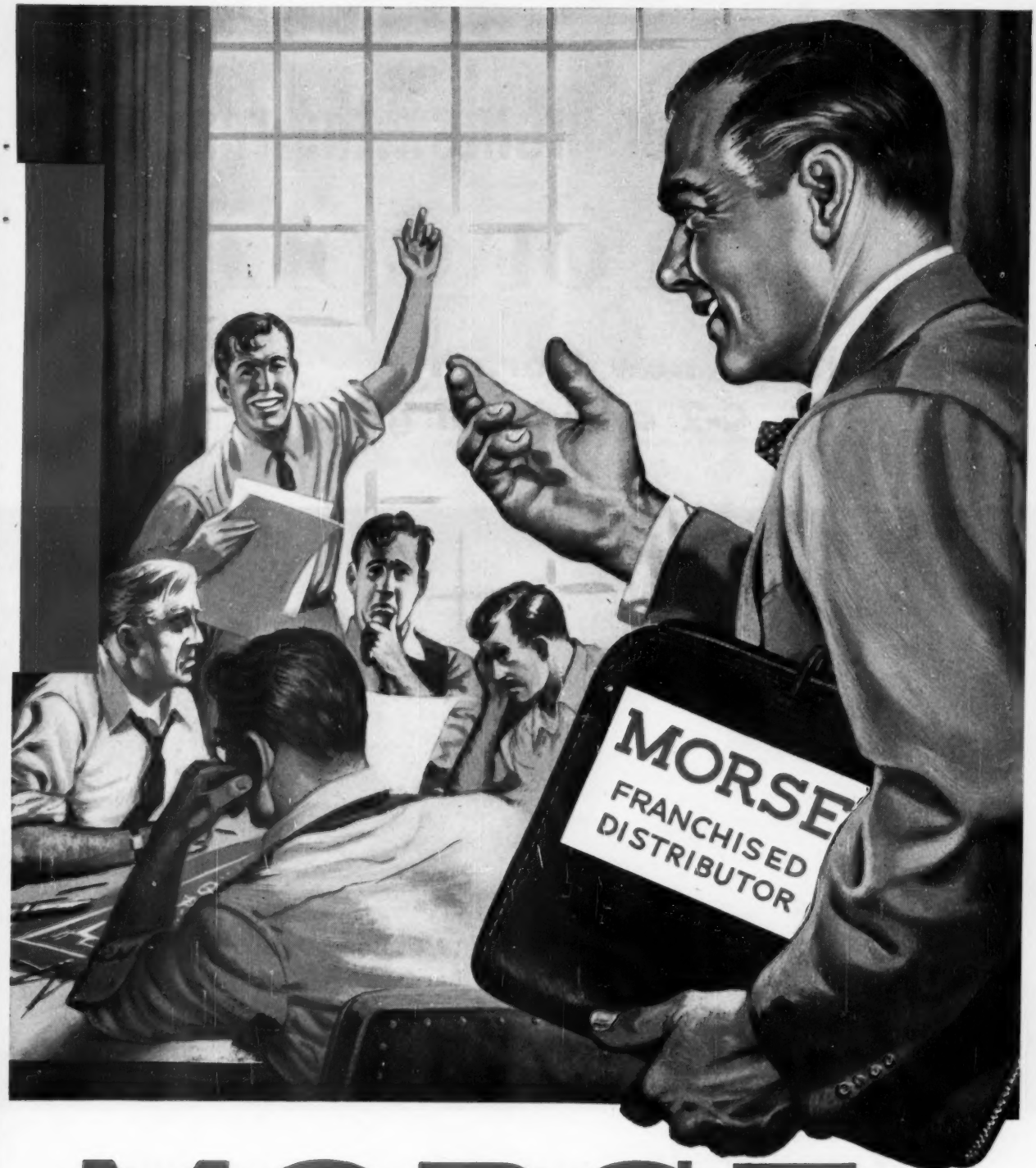
SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Are You making full use of your "friend in time of need?"

He's no "fair-weather friend"— your Morse-Franchised Distributor. He's your *first aid* in time of trouble, when time's a-wasting. Whatever you need in Morse Cutting Tools, he's got it or can get it on the jump. And he knows his book on engineering these tools to your job. Yes, he's right on the spot to save you production time . . . not to mention purchasing and bookkeeping time, too.

So always call your Morse-Franchised Distributor for the best service on the best cutting tools made. Remember . . . *when he walks in the door, trouble flies out the window.*

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASSACHUSETTS
(Division of VAN NORMAN CO.)
Warehouses in New York, Chicago, Detroit, Houston, San Francisco



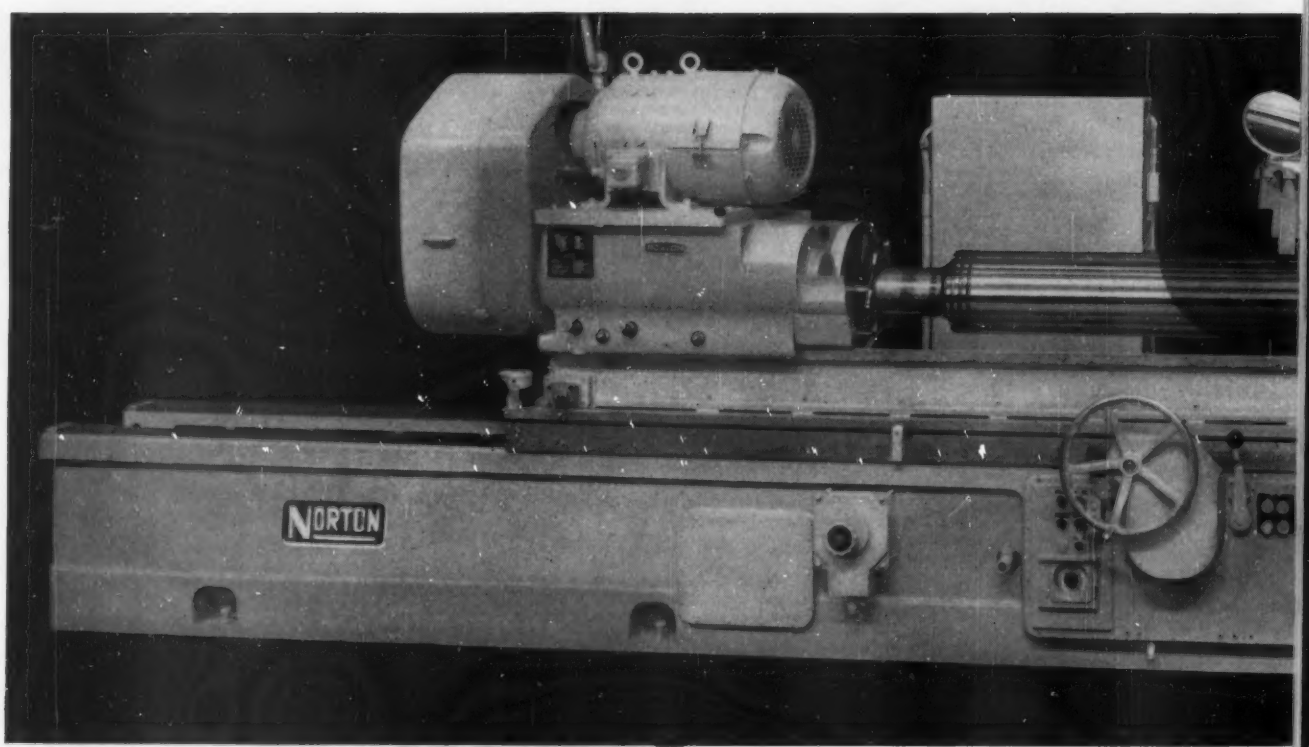
MORSE

Cutting Tools

Buy them by phone from your Morse-Franchised Distributor and save ordering time

You get bigger profits...the real "TOUCH OF GOLD"

with the new Norton C-2 cylindrical grinder

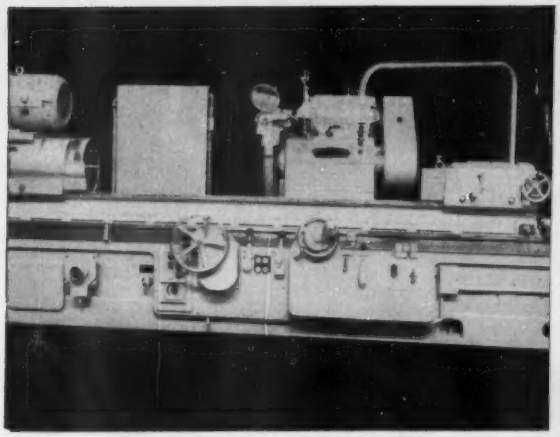


Faster cutting . . . quicker set-up . . . easier operation

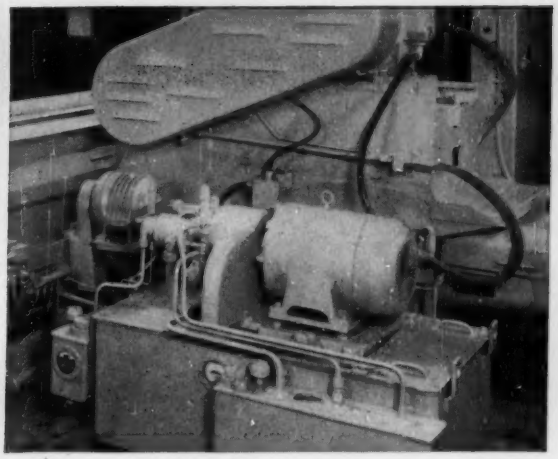
This is the kind of grinding machine you expect from Norton — one that's tops for accuracy, production rate and ease of operation.

The new C-2 gives you more heavy production because it works more of the time — and works faster and easier. When used as a semiautomatic all your operator does is set it up and push the button for automatic grinding to exact size and finish.

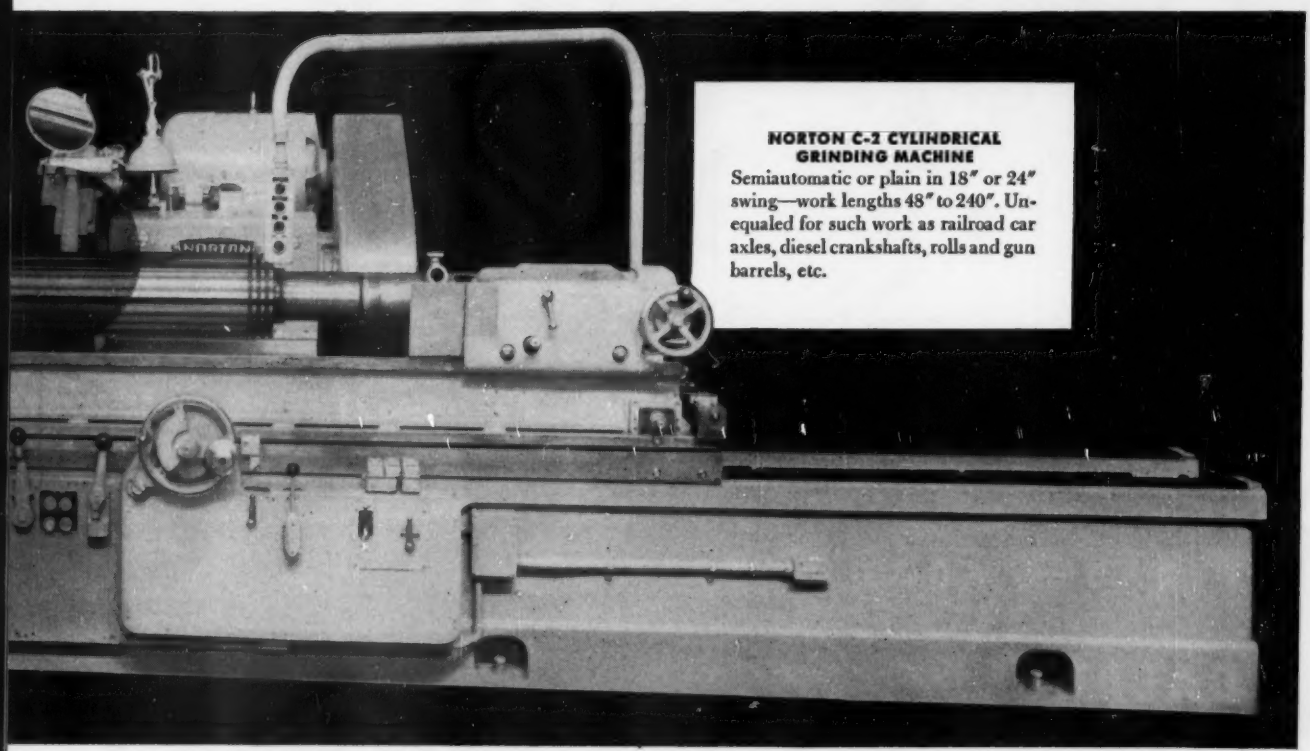
Remember, only Norton offers you such long experience in both grinding wheels and machines — assuring you the



EASY TO SET UP AND OPERATE. All controls in front for minimum set-up time, quick change-over and no reaching by operator. Graduated feed hand wheel indicates feed. "Click-counter" signals each .0001" reduction in work diameter. Table-truing and grinding speeds may be pre-set, and obtained by selector lever.



EASY TO MAINTAIN. All maintenance points on outside. Pumps, motors, filters, lubrication valves and all reservoirs easily accessible. Electrical controls grouped for easy inspection and enclosed for protection.



NORTON C-2 CYLINDRICAL GRINDING MACHINE

Semiautomatic or plain in 18" or 24" swing—work lengths 48" to 240". Unequaled for such work as railroad car axles, diesel crankshafts, rolls and gun barrels, etc.

. . . less down-time

value-adding, "Touch of Gold" that means more and better products for less cost.

Get ALL The Facts. Your Norton Representative will be glad to give you further details on the new C-2, and to discuss your grinding problems or, write direct to NORTON COMPANY, Machine Division, Worcester 6, Mass.

To Economize Modernize With **NEW**

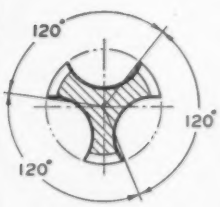
NORTON

GRINDERS and LAPPERS

Making better products to make other products better

District Sales Offices: Hartford • New York • Cleveland • Chicago • Detroit
In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5

1



Exact Flute Spacing

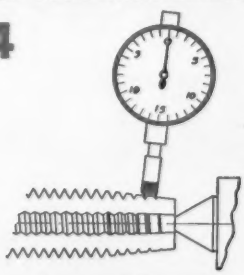
2

Uniform Flute Contours

3

Precision Chip Driver Contours

4



Accurate and Concentric Chamfers

1+2+3+4 ADDS UP TO

BALANCED *Action*

To lower your cost of tapped holes, look first to the excellence of the tools. Winter taps perform with BALANCED ACTION to give you consistently accurate work—minimum scrap loss—long tool life. Get lower-cost holes by giving the job to WINTER.

ALWAYS AT YOUR SERVICE

Your local Industrial Supply Distributor carries a complete stock of WINTER Taps.

WINTER

WINTER BROTHERS COMPANY

Rochester, Michigan, U. S. A. Distributors in principal cities. Branches in New York, Detroit, Chicago, Dallas, San Francisco. Division of National Twist Drill & Tool Co.

NATIONAL TWIST DRILL & TOOL ROCHESTER, MICH. U.S.A.

National

Metalcutting IS FAST, CLEAN, ECONOMICAL WITH CUTTING EDGES LIKE THESE

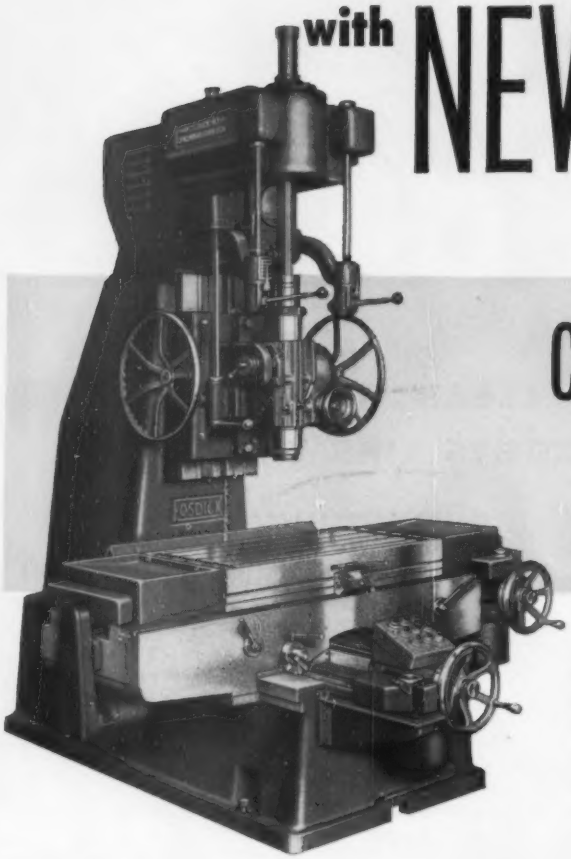
It has been wisely said that "no craftsman is better than his tools." Cutting tools by National give long, dependable performance. With National cutting tools in your machines, your craftsmen have *the edge!*

NATIONAL TWIST DRILL AND TOOL COMPANY
Rochester, Michigan, U. S. A. Distributors in principal cities. Factory Branches: New York • Detroit • Chicago • Dallas • San Francisco

CALL YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

. . . for all your staple industrial needs, including NATIONAL Twist Drills, Reamers, Counterbores, Milling Cutters, End Mills, Hobs, and Special Tools.

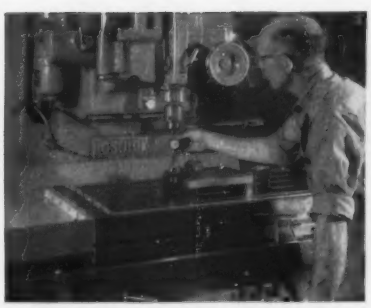
with NEW Fosdick BF Spindle



change boring tools repeat hole size

No more "cut and try" resetting of boring tools every time you change them! With the new BF Spindle you can change tools in seconds with such accuracy that hole sizes are repeated within ± .0001", *without* resetting. Slash time drastically, whether boring a "one-shot" jig with many different size holes or producing work where repetitive precision is essential.

Fast tool changing with Automatic Positioning for High-Speed, Precision Boring to a NEW Degree never before obtainable.

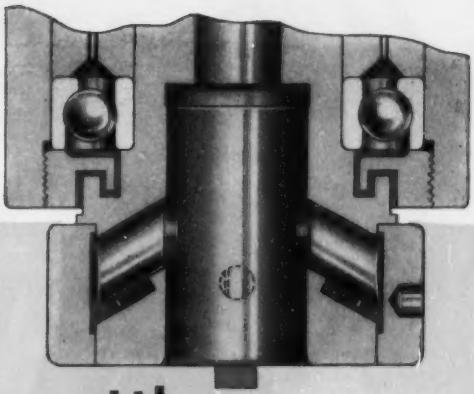


Drop duplicating bars in place—position work for first hole and bore. Then...

PRESS the button—and in the twinkling of an eye—you're positioned within ± .0001" for the next operation.

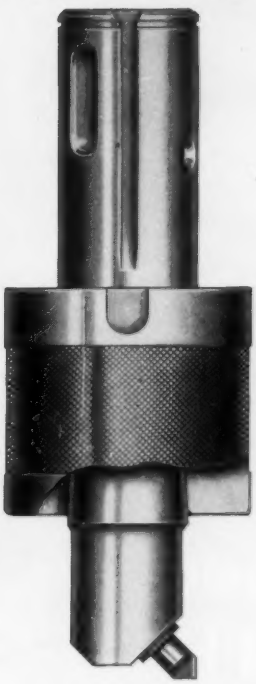
Fosdick builds Automatic Positioning into its Jig Borers to give you ± .0001" table positioning *in seconds* simply by pressing a button—even with inexperienced operators. Only two easily-made, easily-stored duplicating bars are needed for each job. Once bars are set, work initially positioned, press button and, in seconds, you're ready for the next operation! This is Fosdick's precision combination—*One hole or a thousand, same size or different, you'll hold both position and hole size to ± .0001"!*

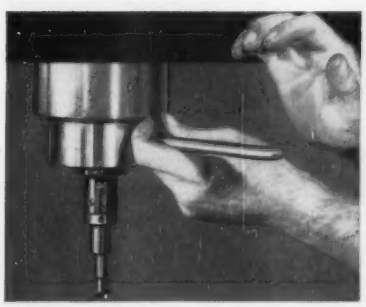
For more information write for these bulletins: Fosdick Jig Borer.....Bulletin 42A Automatic Positioning .....Bulletin 42PA BF Spindle...Bulletin BFA



in seconds... to ±.0001" without resetting

High-precision tool holder is built integral with Jig Borer spindle. Straight-shank tool adapters fit holder precisely – wipe surface clean as tool is inserted, keep dust and dirt from upsetting precision fit. Both adapters and tools "keyed-in" for identical repositioned accuracy.

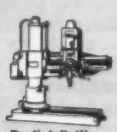




With the BF Spindle, you can change boring tools while the machine positions. Simply loosen cam ring with spanner wrench. Further hand rotation releases tool.

Then insert new tool, tighten cam ring and you have Fosdick's precision combination—tool changing and work positioning both to ±.0001" in a matter of seconds!

Need Drilling Equipment? Get a Proposal from Fosdick!



Radial Drills

Jig Borers

Sensitive and Upright Drills

Sensitive Radial Drills

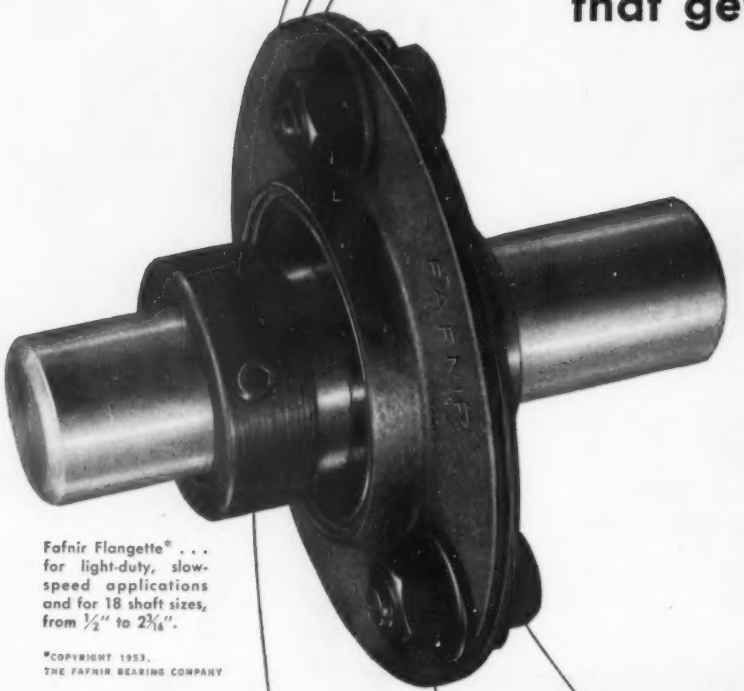
Automatic Positioning Machines

FOSDICK

THE FOSDICK MACHINE TOOL CO., CINCINNATI 23, OHIO

Design Strategy

that gets more for less



Fafnir Flangette* . . . for light-duty, slow-speed applications and for 18 shaft sizes, from ½" to 2¾".

*COPYRIGHT 1953, THE FAFNIR BEARING COMPANY

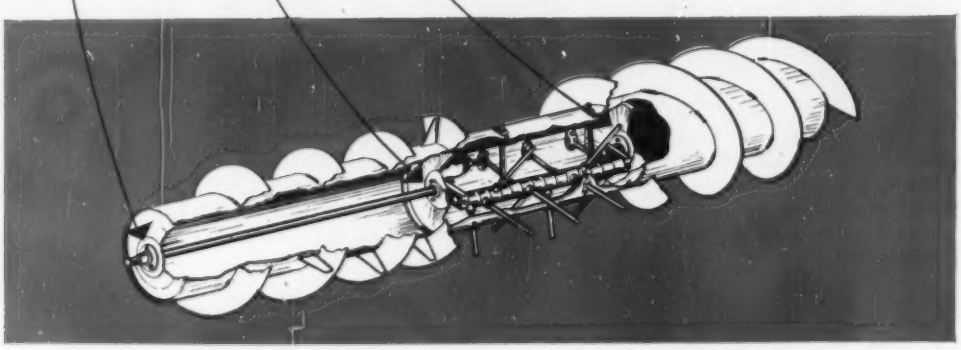
By installing Fafnir Flangettes on the loading auger shaft of a self-propelled combine, a manufacturer of farm equipment improved auger performance and reduced manufacturing costs at the same time.

Equipped with Fafnir Ball Bearing Flangettes, the auger required less power to operate, no re-lubrication, no bearing adjustments and its service life was extended substantially. In addition, whenever servicing of auger parts required disassembly and reassembly, Fafnir Flangettes saved important man-hours.

From a manufacturing angle, Fafnir Flangettes eliminated the need for fabricating bearing housings with attendant lubricating systems.

They have their *own* easily applied housings—paired pressed steel flanges, which enclose a self-aligning Fafnir Wide Inner Ring Bearing with Self-Locking Collar—easiest of all bearings to install.

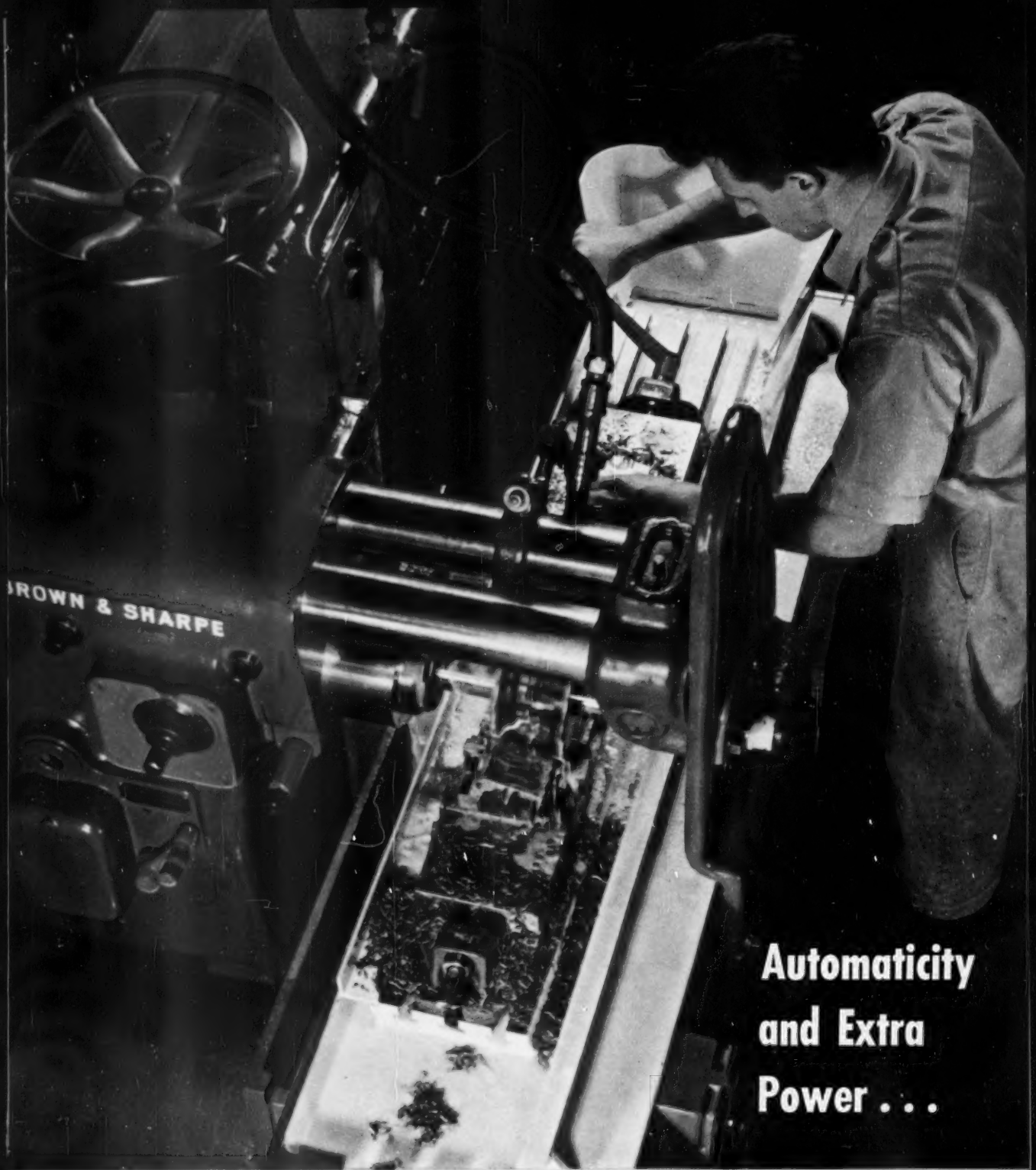
The mated eccentric cam design of the bearing inner ring and collar provides positive locking action without set screws, locknuts, or adapters — eliminates shaft slippage or scoring. Efficient seals keep grease in — contaminants out.



Here is another result of the Fafnir "attitude and aptitude," a way of looking at bearing problems from the designer's viewpoint . . . an ability for supplying the right bearing to fit the need. Maybe this combination can help you solve a bearing problem. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR
BALL BEARINGS

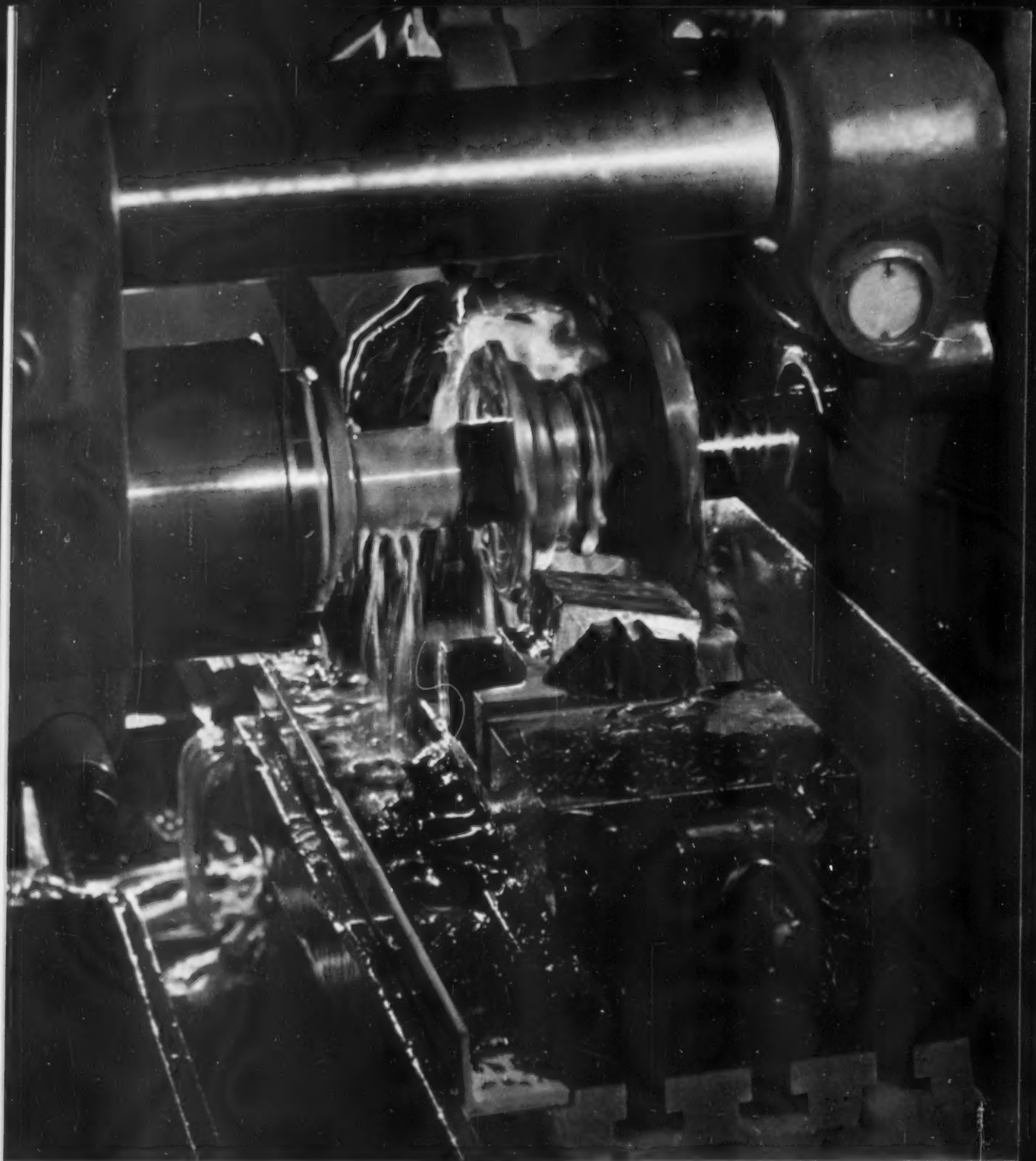
MOST COMPLETE LINE IN AMERICA



Automaticity and Extra Power . . .

Brown & Sharpe

. . . the 7½ H.P., electrically-controlled No. 12 Plain Milling Machine. You get full 7½ H.P. right at the spindle plus "push button" or automatic control of all power movements for rapid production on both long- and short-run jobs. Dual feed rates, a variety of automatic cycles, and the ability to climb mill in either direction are just a few of its other time-saving advantages. Write for complete details.



For top milling efficiency, buy long-wearing cutters from the Brown & Sharpe Complete Line . . . and always keep them "Cutting Sharp".

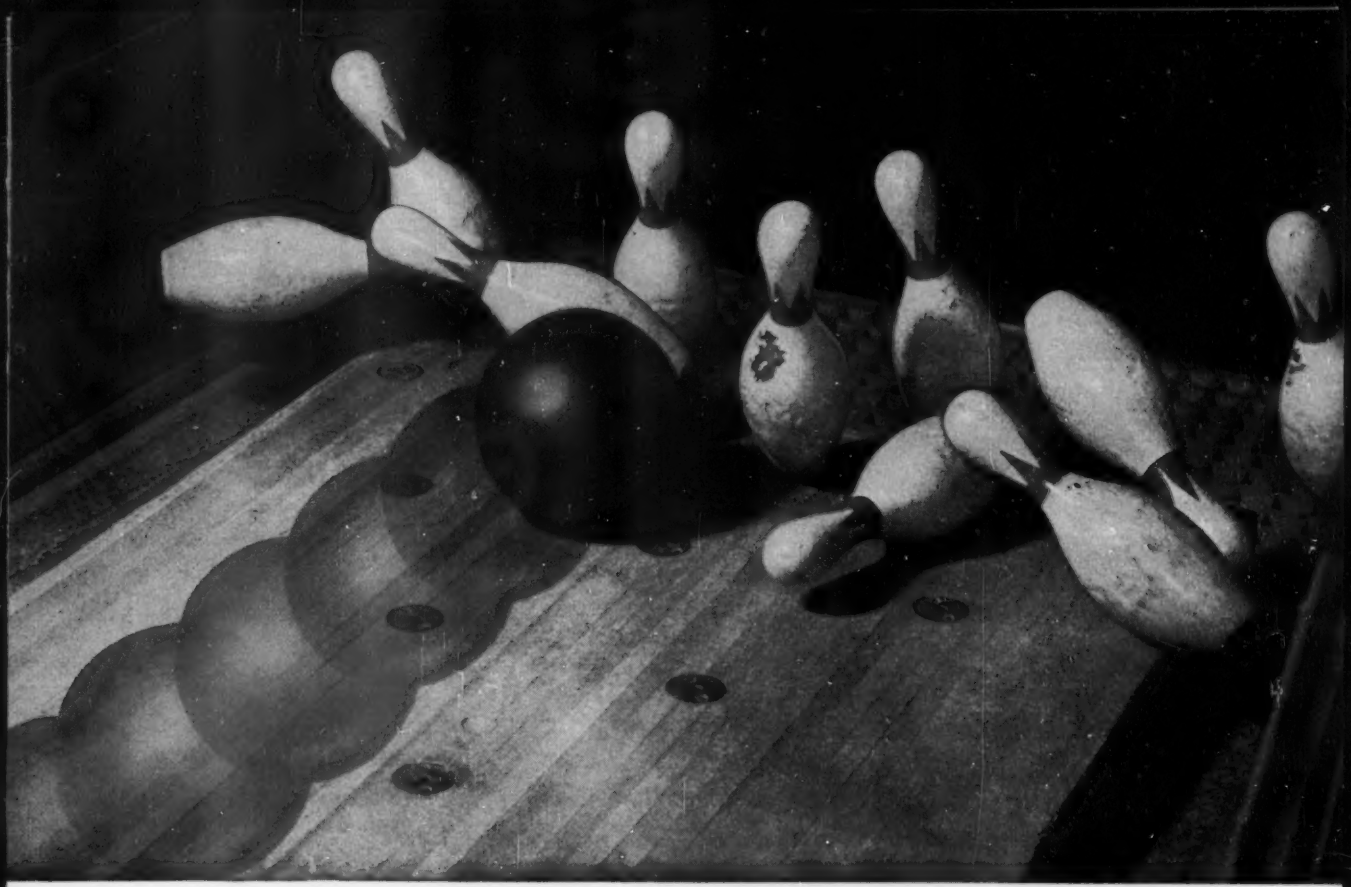
Buy through your local Distributor

Brown & Sharpe

BROWN & SHARPE MFG. CO., PROVIDENCE 1, R. I., U. S. A.

Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
Machinists' Tools • Electronic Measuring Equipment • Johansson Gage Blocks • Permanent Magnet Chucks • Pumps

Printed in U.S.A.



What's the **score** in **your shop**?

You're bound to be way out ahead—with a "ten-strike" in every frame—if your cutting fluid is CIMCOOL°. Because this radically new and different coolant *covers 85% of all metal cutting jobs . . . and does a better job.*

Naturally Cimcool puts you in the winning column. It's a *chemical emulsion.* Cimcool replaces all water emulsions and all but a few highly compounded specialty oils. It permits faster speeds and increases tool life because it combines friction reduction and cooling capacity in a degree never before attained by old-fashioned coolants. It's longer lasting in machines. So Cimcool reduces downtime and cuts labor costs for cleaning and changing.

Frankly, we're sure that *you'll* be bowled over when you see what Cimcool can do for you. For a demonstration, just write us and we'll have one of our Cincinnati Milling-trained machinists call on you—without cost or obligation. Or, if you prefer, write for our free booklet, "Cimcool Defeats Heat." Address Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

°Trade Mark Reg. U.S. Pat. Off.

CIMCOOL

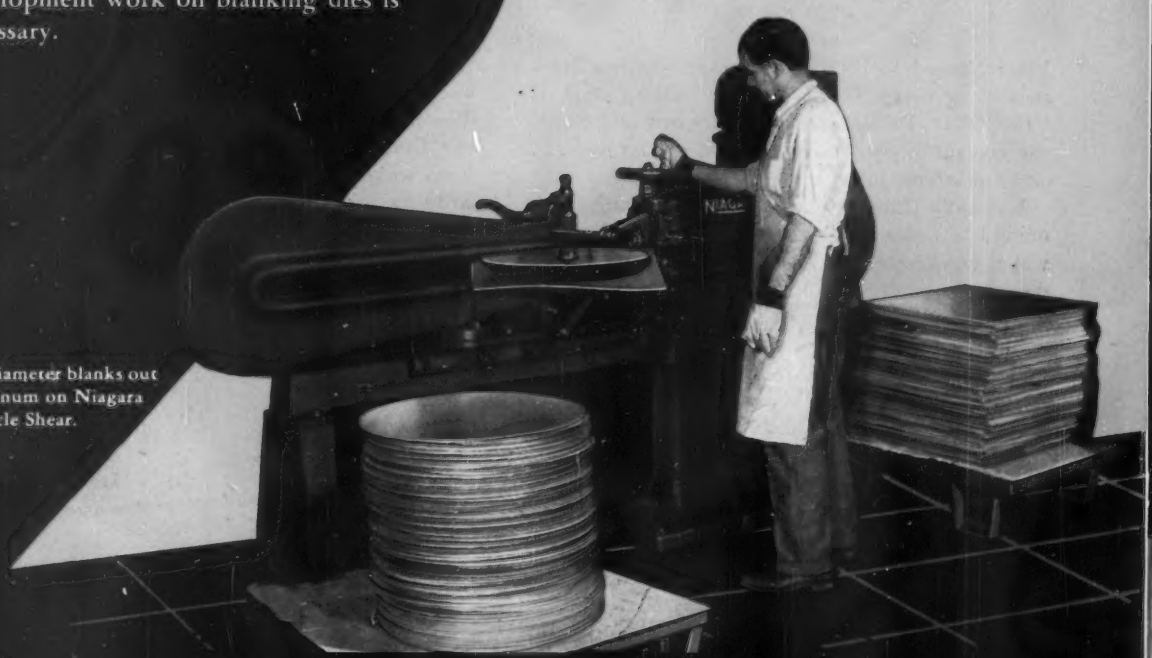
A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Select NIAGARA

NIAGARA RING AND CIRCLE SHEAR

- ★ Circular blanks of various diameters and thicknesses are quickly and accurately cut.
- ★ Initial cost and maintenance of blanking dies is eliminated.
- ★ Wide range of sizes can be produced in the circle shear with less set-up time than is required for setting-up a blanking die.
- ★ Sturdy construction insures minimum maintenance costs.
- ★ The size of the blank can be easily changed to accomplish the results required in the drawing operation. No development work on blanking dies is necessary.

For instance, in the Buffalo Plant of American Machine & Foundry Company a NIAGARA Ring and Circle Shear is teamed up in economical production with a NIAGARA Double Crank Press making aluminum equipment.



Cutting 22" diameter blanks out of 1/8" aluminum on Niagara Ring and Circle Shear.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

Machines which suit YOUR Production Requirements

NIAGARA DOUBLE CRANK PRESS

★ The use of Niagara pneumatic cushion permits drawing operations in a single action press.

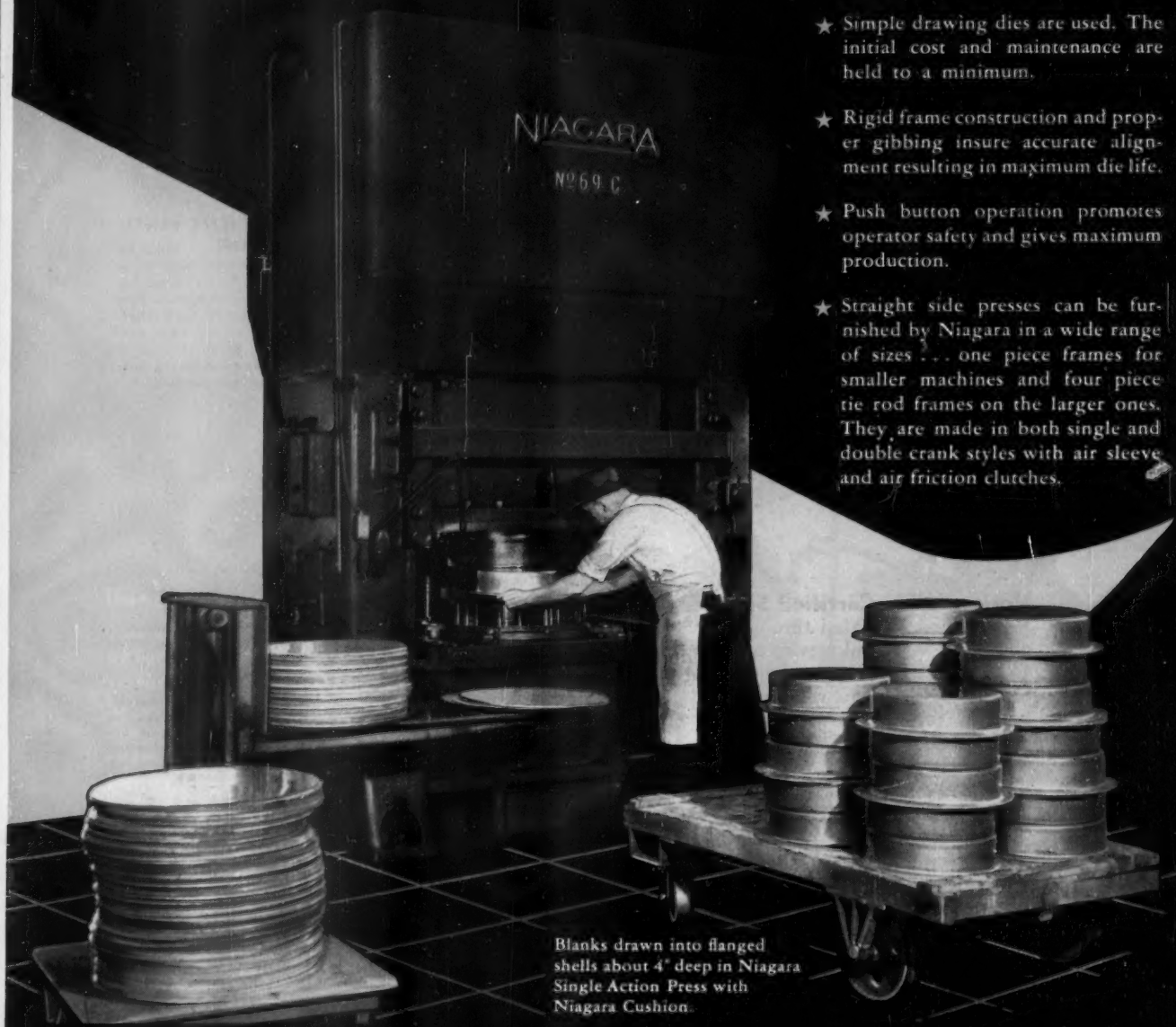
★ Less set-up time is required than in a double action press where two slides must be adjusted for each thickness.

★ Simple drawing dies are used. The initial cost and maintenance are held to a minimum.

★ Rigid frame construction and proper gibbing insure accurate alignment resulting in maximum die life.

★ Push button operation promotes operator safety and gives maximum production.

★ Straight side presses can be furnished by Niagara in a wide range of sizes . . . one piece frames for smaller machines and four piece tie rod frames on the larger ones. They are made in both single and double crank styles with air sleeve and air friction clutches.



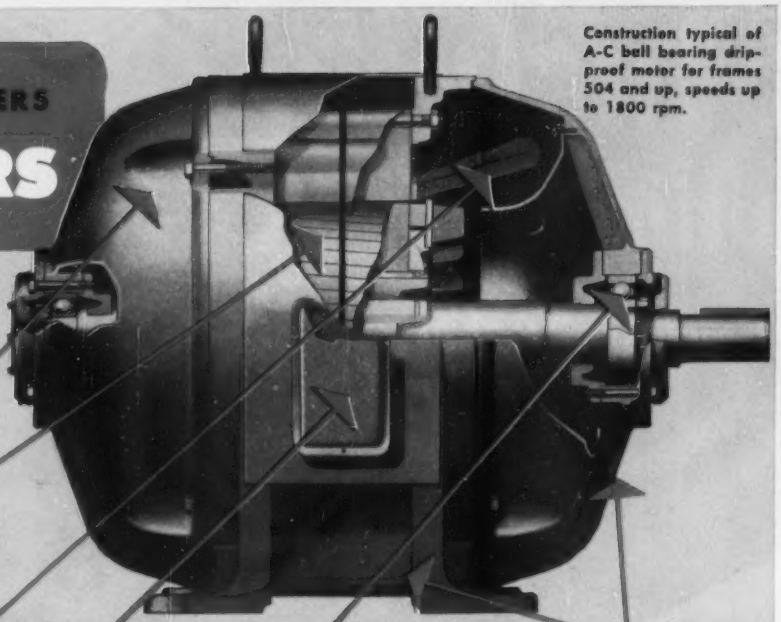
Blanks drawn into flanged shells about 4" deep in Niagara Single Action Press with Niagara Cushion.

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

America's Most Complete Line Presses, Shears, Machines and Tools for Sheet Metal Work

ALLIS-CHALMERS

MOTORS



Construction typical of A-C ball bearing drip-proof motor for frames 504 and up, speeds up to 1800 rpm.

All These Features of Good Motor Design

CAST IRON END SHIELDS— assure distortion-free bearing support for maximum bearing life, correct rotor alignment, uniform air gap.

BRAZED CAGE WINDING — copper or copper alloy cage bars are brazed to end ring to produce a practically indestructible rotor winding.

STATOR COILS—multiple-dipped, baked after each dip. Build up tough protection against heat, moisture and corrosive atmosphere.

ROOMY CONDUIT BOX — has ample room for easy connection of leads, may be rotated in 90 degree steps.

CHOICE OF BEARINGS — motors may be obtained with either ball or ring-oiled sleeve bearings. Ball bearings are housing mounted with provisions for in-service lubrication.

EFFICIENT VENTILATION — large intake and discharge openings with ample-sized fan assure a sweeping flow of cooling air. Careful baffling of air flow and plenty of space back of stator core assure adequate, even cooling.

3 Extra Values

1 Nation-Wide Certified Service — Allis-Chalmers Certified Service Shops located throughout the country provide factory-approved parts and service on your Allis-Chalmers motors. A-C Certified Service Shops are independently owned shops that meet the strict A-C standards for modern equipment, experience, and business integrity. They provide you with prompt, economical repair and maintenance.

2 Complete Drive From One Source Allis-Chalmers can supply your complete drive — control — motor — *Texrope* V-belt drive — from one convenient source.

3 Competent Engineering Help Your local Allis-Chalmers District Office representative or Authorized Distributor will be glad to help you select exactly the right motor for your needs. For additional information, write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B6052.

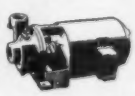
A-4227

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE V-belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.



PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

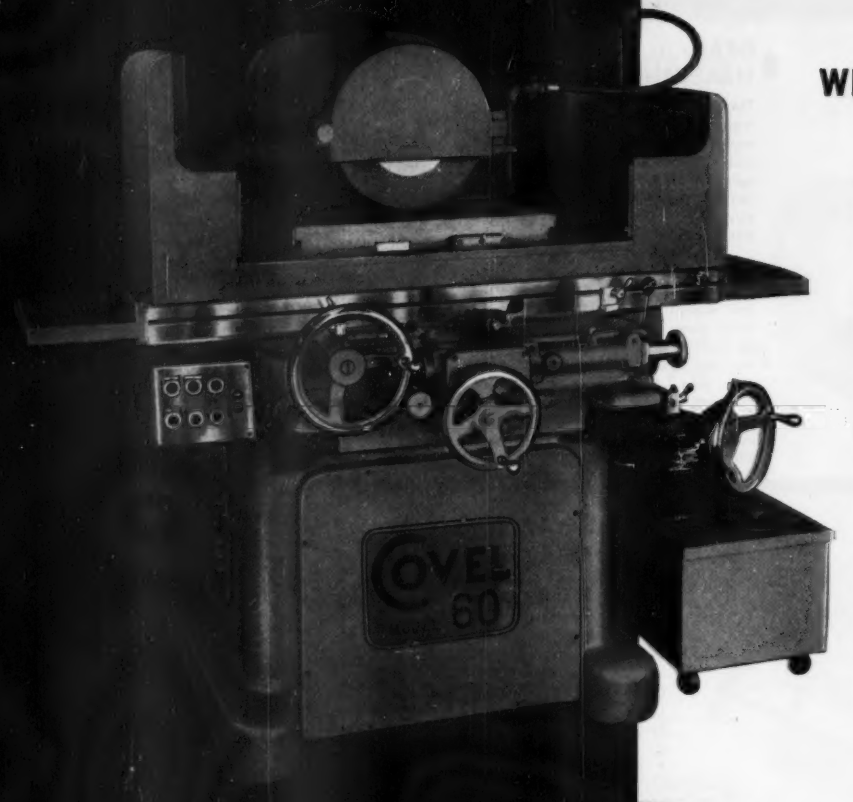
Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

COVEL No. 60 SURFACE GRINDER . . . ENTIRELY NEW

WITH 15" CROSS FEED



Covel presents the No. 60 — latest in its 80-year line of precision machines . . . This ultra-modern surface grinder features a 14" x 24" work surface . . . 15" width of cross feed . . . 27" table travel . . . vertical work capacity of more than 18" . . . automatic, closed circuit hydraulic system . . . powered elevation and a long list of advantages best described in a new bulletin . . . yours for the asking.

Here's a Typical Use:

This new "60" is set up for wet grinding the surface of a trim die for die castings — but one of the wide range of tool room and production jobs for which this latest Covel grinder is suited.

WRITE FOR *New Bulletin* No. A-24

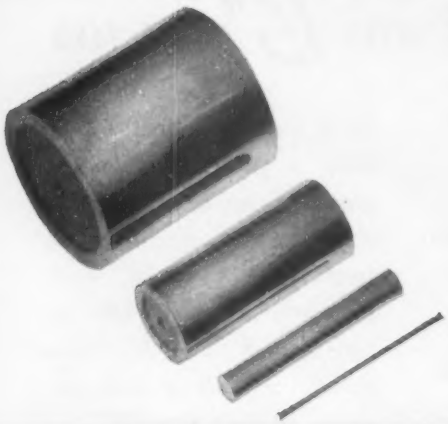
80 YEARS of continuous manufacturing experience makes your COVEL choice a sound one.

COVEL PRECISION GRINDERS

BENTON HARBOR, MICHIGAN

DRILL GRINDERS • UNIVERSAL CUTTER & TOOL GRINDERS • HYDRAULIC & HAND FEED SURFACE GRINDERS

"VK" ... the Sign of Pioneering and

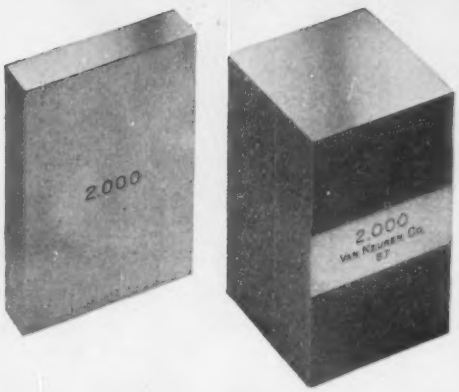


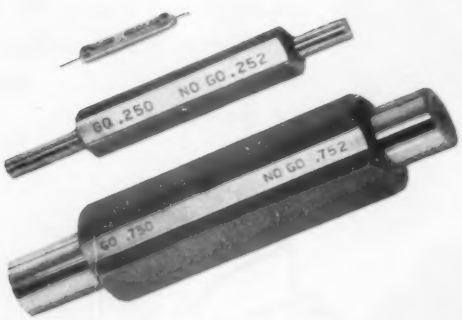
GEAR MEASURING WIRES

The Van Keuren Gear Measuring System is generally accepted as the easiest and most accurate method of checking tooth thickness of gears, involute splines and involute serrations. Catalog and Handbook No. 35 contains complete information and tables for gear measurements with wires.

GAGE BLOCKS

The conventional Rectangular Gage Block shown, .360 x 1.375", area .50 sq. inches, is designed for ordinary use; the Solid Square Master Block, 1¼" x 1¼", area 1.56 sq. inches, is designed for many years' service, and unconditionally guaranteed against wear in excess of .0001" for 5 years. See Van Keuren Handbook for details.





WIRE TYPE PLUG GAGES

Made in all sizes from .010" to 1.000" diameter. Originated by Van Keuren. Recommended materials:
High Speed Steel, in sizes from .010" to .050"; Chromium Alloy Tool Steel, in sizes from .051" to 1.000"; Hard Chromium Plate, in sizes .016" to 1.000"; VK Carboloy, sizes from .016" to .500".

OPTICAL FLATS

Ideal for all kinds of flatness tests, checking parallelism with elimination of temperature errors. New Van Keuren Light Wave Measuring Equipment includes double-surface fused quartz optical flats and improved monochromatic light of proved superlative value and economy. See Van Keuren Handbook for complete information.

35 years
1919
1954

In the Van Keuren family of Precision Measuring Tools are included the world's most accurate—tools for checking to hundred-thousandths and millionths of an inch. Whether gage blocks, optical flats, plug gages or measuring wires are required, all will incorporate Van Keuren quality. And no commercially practical measuring tools are available today for closer tolerance determination than those which are being regularly and currently produced by Van Keuren for everyday use in the metalworking industry.

Should future precision standards demand even closer checking than is now practical, metalworking can look with confidence to Van Keuren pioneering and leadership to develop and provide such measuring tools as may be required.

THE Van Keuren CO.

173 WALTHAM STREET

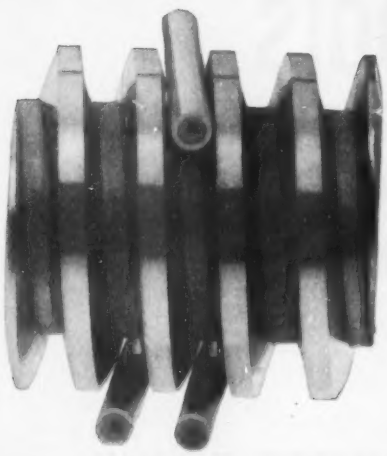
Leadership in Precision Measurements

LIGHT WAVE MICROMETER

The Van Keuren Light Wave Micrometer, furnished in 0 to 1", 0 to 2", or 0" to 3" models, is ideal for measuring plug gages or small precision parts. It can be used at measuring pressures of from theoretical zero to 2½ pounds. It is not a comparator and no gage block combinations are needed. To be used when you're after "that last hundred-thousandth" of an inch. See Van Keuren Handbook for details.

MICROGAGES

Van Keuren Microgages have been popular for over twenty-five years because they provide a low cost means of securing accuracy in the shop to meet the demands of the inspection department. These ⅜" diameter gages are made to a tolerance +.000012" —.000008". For standard sets, see Catalog No. 35.



THREAD MEASURING WIRES

Available for every purpose—for worms, splines, gears, standard and special screw threads. Illustration shows .2574" diameter Flush Wires in a 29° worm having 2 threads per inch. For multiple start worms having lead angles greater than 5°, see VK screw thread tables in Handbook which gives Exact Best Size wire and exact measurement over the wires. VK Thread Measuring Wires are standard everywhere.

CHROME CARBIDE TAPER INSERTS

In addition to its regular line of tungsten carbide wire type plug gages from .016" to .500" diameter, The Van Keuren Co. now offers a new line of Chrome Carbide Taper Insert Plug Gages in the range from .500" to 1.510" diameter. These lighter, longer-wearing gages are available in Class Y, X and XX accuracies, and have a *surface finish of .5 RMS or better.*

The metalworking industry has come to look to Van Keuren not only for precision measuring tools but also for the ways and means of applying them in the tool room and on the production line. Procedures developed by Van Keuren are in many cases standard shop practice today. We point specifically to gear measurement techniques, as applied regularly in today's gear-making shops and departments, most of which are a pioneering contribution by Van Keuren.

To make all this data and all the formulas required conveniently available, Van Keuren publishes its 224-page Catalog and Handbook containing material obtainable nowhere else under one cover—a Handbook of vitally important and usable information on Precision Measuring which is regularly revised and consistent with the most advanced practices and techniques in checking and measuring.

The current 1952 Van Keuren Catalog and Handbook, No. 35, is available on request and includes complete details on the Van Keuren family of Precision Measuring Tools.

Light Wave Equipment . . . Light Wave Micrometers . . . Gage Blocks . . . Taper Insert Plug Gages . . . Wire Type Plug Gages . . . Measuring Wires . . . Thread Measuring Wires . . . Gear Measuring System . . . Shop Triangles . . . Carboloy Cemented Carbide Plug Gages . . . Carboloy Cemented Carbide Measuring Wires . . . Chrome Carbide Taper Insert Plug Gages.

WATERTOWN, MASS.

Specialists in Tungsten Carbide Tools

They're Precision Machine Ground-From-The-Solid

Quality Engineered } BURS, REAMERS, END MILLS BORING BITS & OTHERS

Representatives and Distributors in principal cities in the United States and Canada. Write us for the name and address of our Representative in your area.

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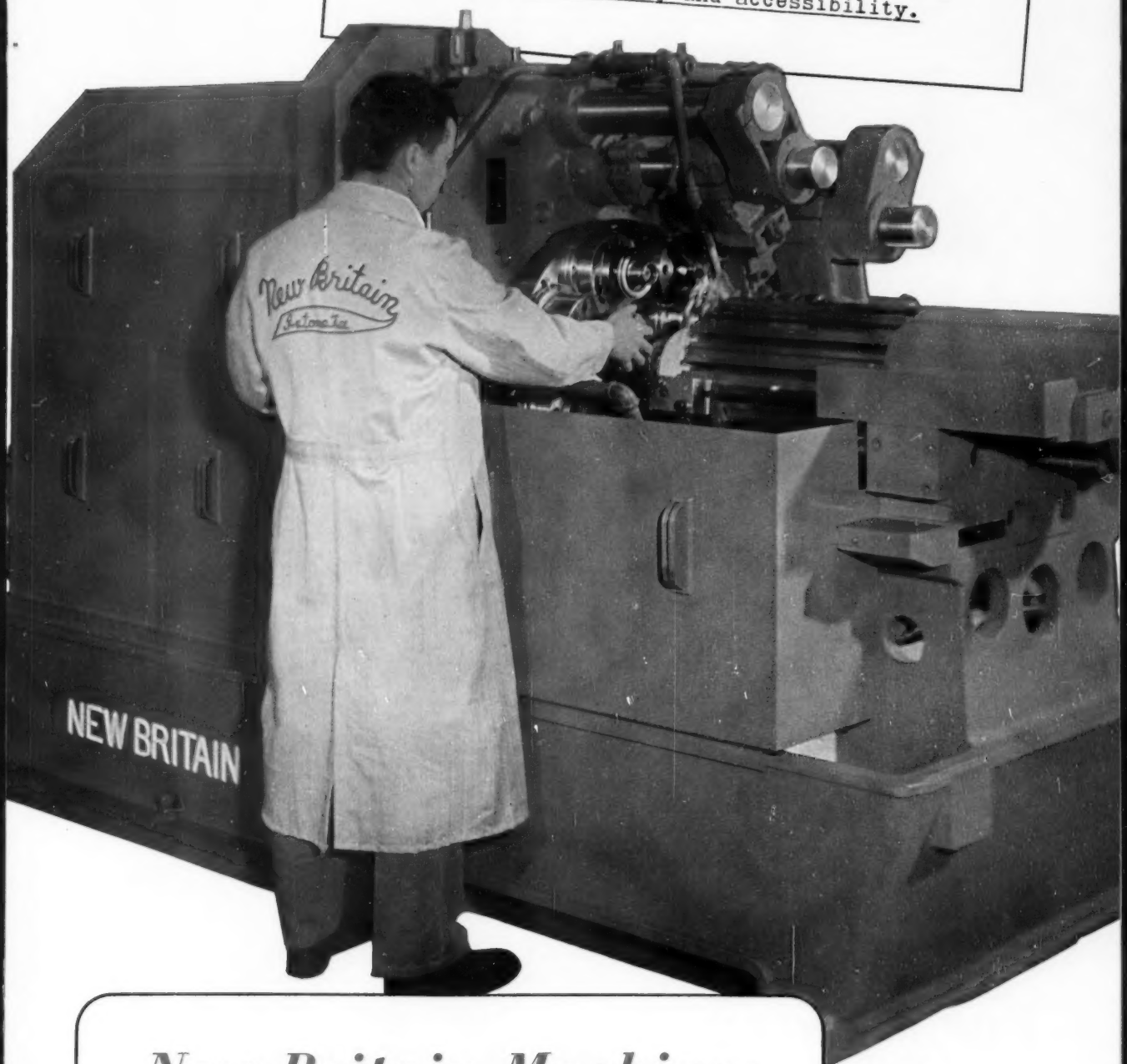
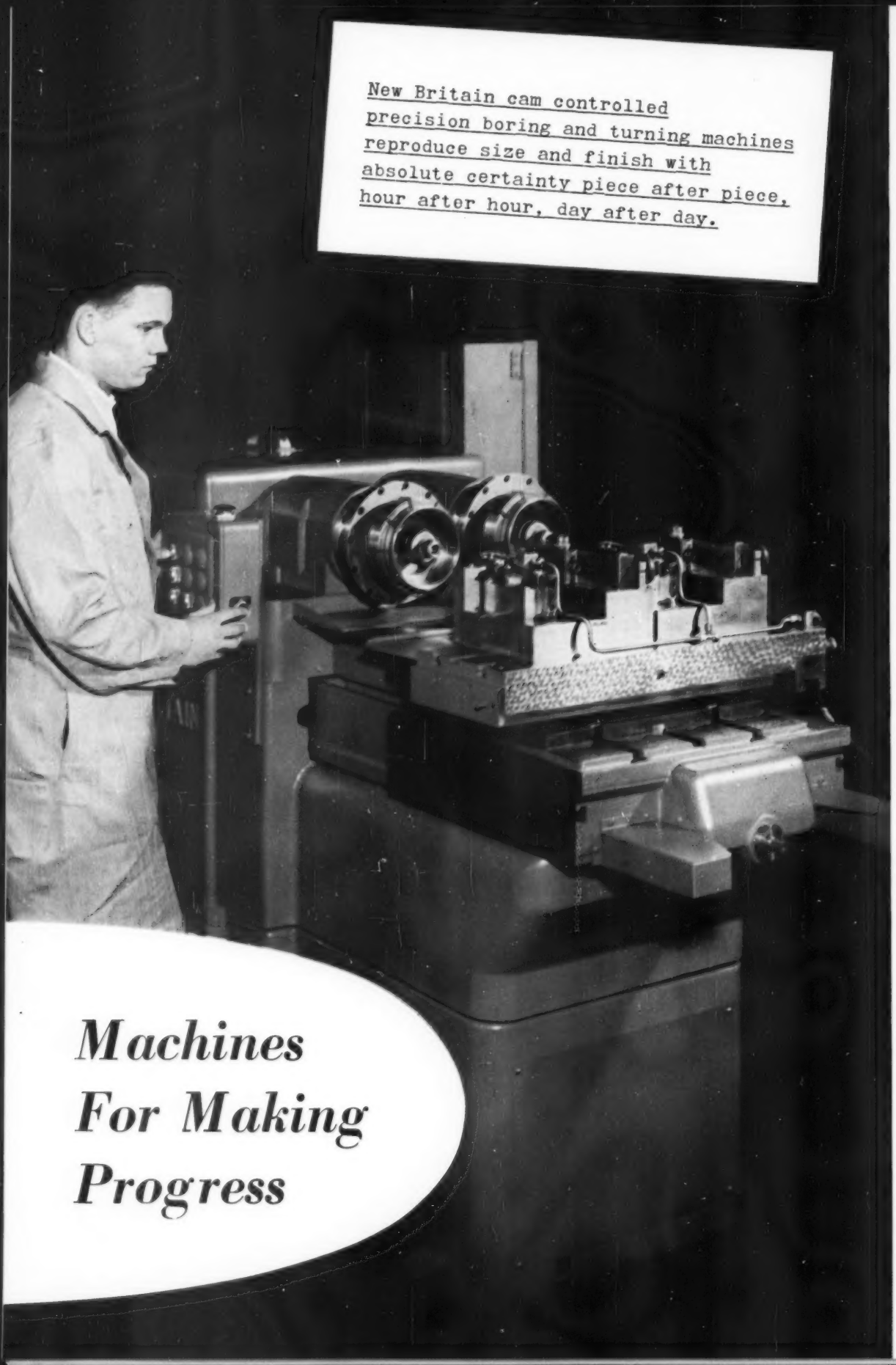
THE ATRAX COMPANY
NEWINGTON 11, CONNECTICUT

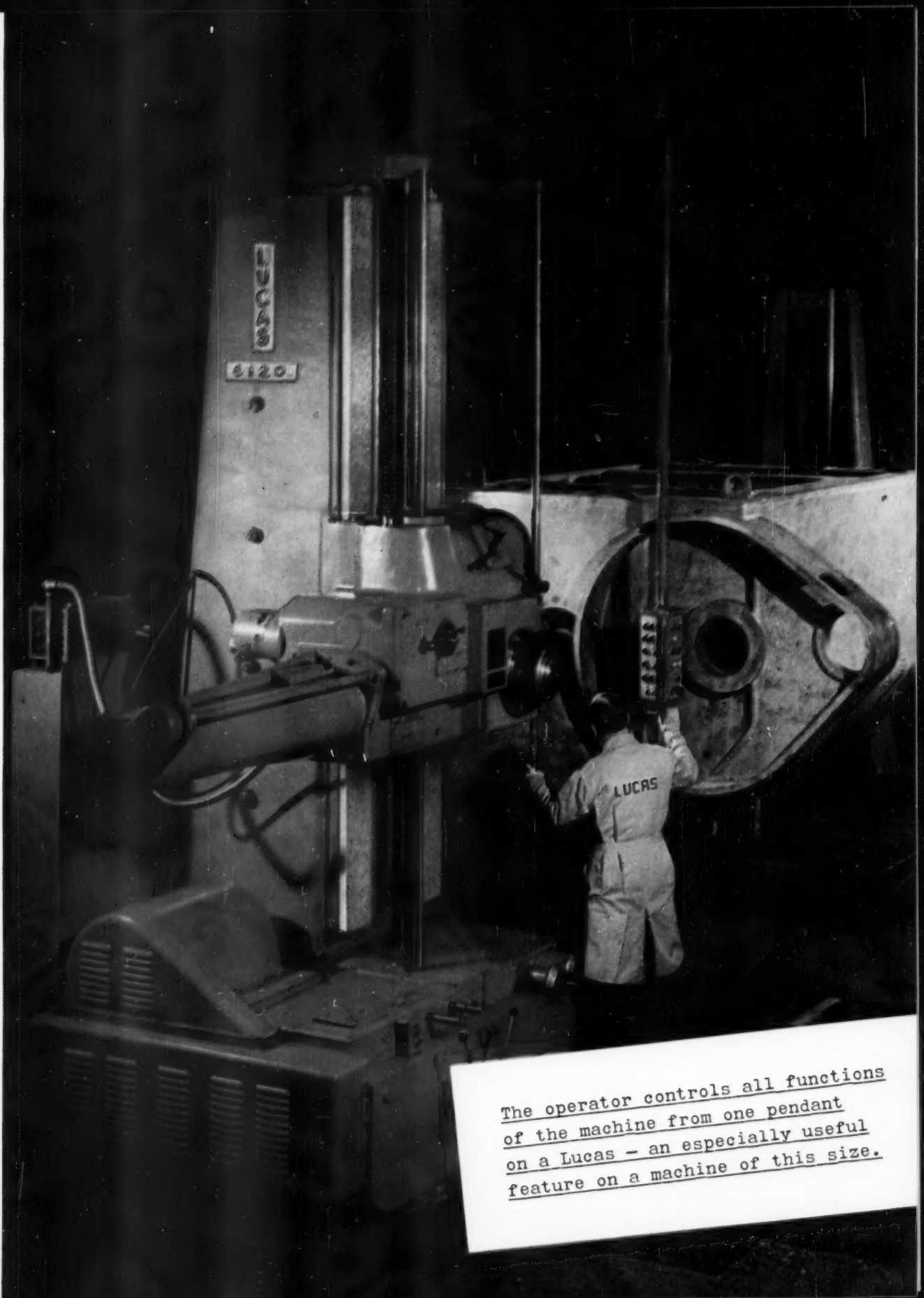
This line of open end New Britain automatic chucking machines for creating greater profits, includes four, six and eight spindle machines up to 12" capacity. All notable for greater productivity, rigidity and accessibility.



New Britain Machines
For Making Progress

NB LUCAS


New Britain cam controlled precision boring and turning machines reproduce size and finish with absolute certainty piece after piece, hour after hour, day after day.
Machines For Making Progress

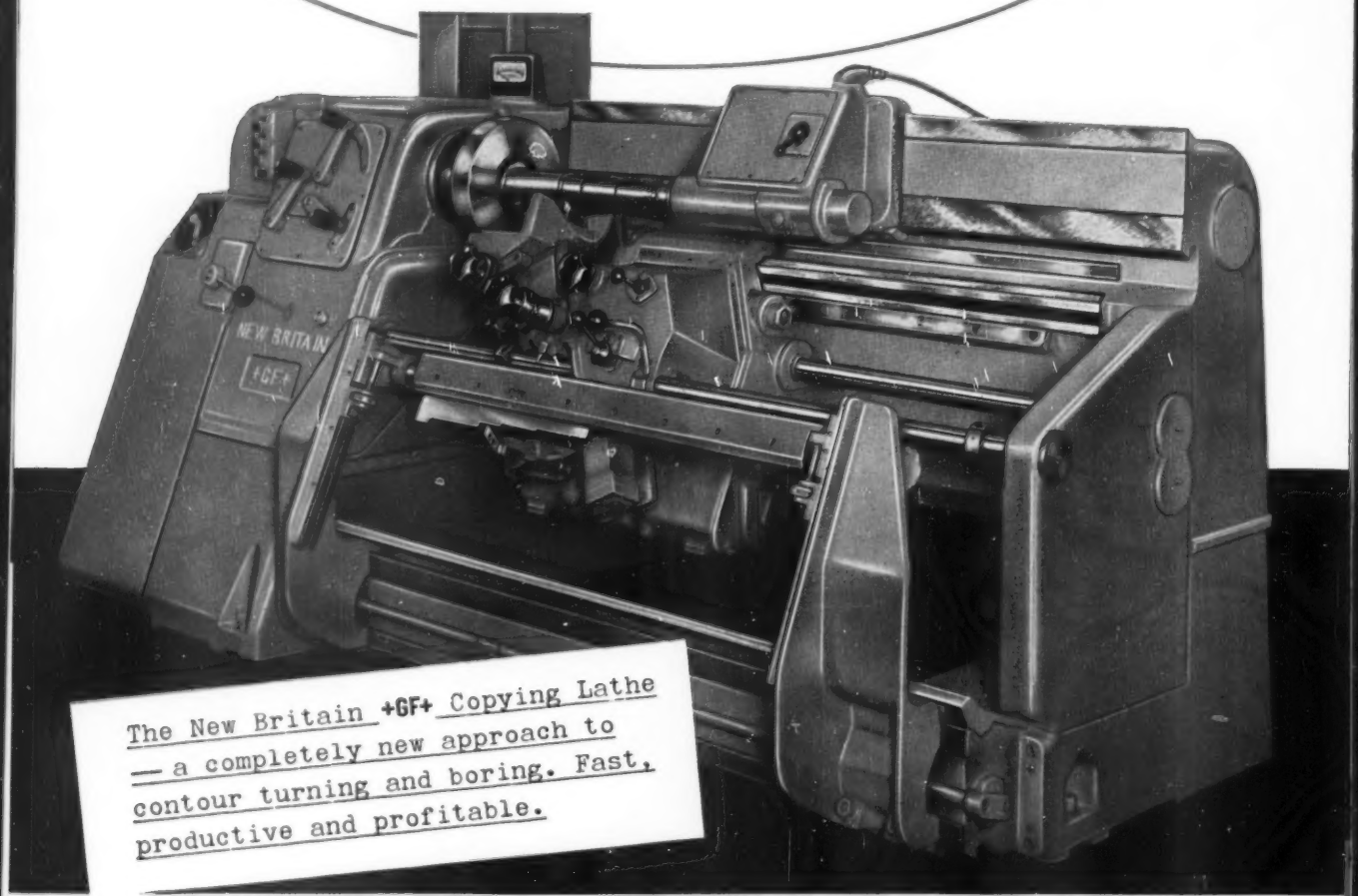


The operator controls all functions of the machine from one pendant on a Lucas – an especially useful feature on a machine of this size.

MACHINES *for* MAKING PROGRESS

HALF a century is a brief time for accomplishing the change from "horse-and-buggy" days to our present way of life. The never-ending search for *better methods* is chiefly responsible for this progress.

Throughout the twentieth century many of the improvements in metalworking methods have been contributed by New Britain and Lucas. The machines we have developed play an important part in improving standards of living in time of peace – and defending them in wartime.



The New Britain +GF+ Copying Lathe — a completely new approach to contour turning and boring. Fast, productive and profitable.

AUTOMATIC BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
LUCAS HORIZONTAL BORING, DRILLING & MILLING MACHINES
NEW BRITAIN +GF+ COPYING LATHES

The NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut
Lucas Machine Division, Cleveland 8, Ohio

Black & Decker
Cases for Comment

MAINTENANCE

(Case History 8168)

Removing rust fast with wire brush and versatile B&D Portable Grinder

CONSTRUCTION

(Case History 10634)

1616 houses built at 2-a-day rate... thanks to B&D Heavy-Duty Saws

PRODUCTION

(Case History 10691)

20% more production 20% faster...it's a Black & Decker Drill

Photo shows drilling of 10 gauge steel for Victor Furnace. Manufacturer reports use of B&D Drill resulted in 20% speed up, 20% production increase. Drills standing up very well after 8–10 years use...8 hrs. a day...5½ days a week.

Jack-Sure shows long, trouble-free service

SMALL DRILLS. Typified by "handful of power" ¼" Heavy-Duty Holgun.* Ideal production tool. Exceptional in "close-corner" drilling.

LARGER DRILLS . . . Models and speeds to fit any job in capacities from ¼" to 1¼" in steel, double in hardwood.

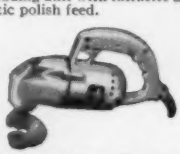
SCREW DRIVERS . . . Drive anything from delicate screws to large nuts and bolts. Many models, positive and adjustable clutches.

SANDERS . . . Drive abrasive discs, wire cup brushes, saucer grinding wheels, other attachments. Four models, 7" and 9" capacities.

BENCH GRINDERS . . . Three models, 6"—10" wheel diams., ¼ to 1 H.P., for sharpening, grinding, wire brushing, buffing.

POLISHERS . . . Clean, polish, seal in *one* operation. Three models including unit with *exclusive* automatic polish feed.

HAMMERS . . . Drive star drills, bull points, etc., in masonry, other materials. Four models, ½" to 2" hole-capacity in concrete.



PORTO-SHEARS* . . . For fast, accurate cutting of ferrous and nonferrous sheet metal. Two models, 12 & 16 gauge capacities in steel.

VALVE SEAT GRINDERS . . . Famous "Vibro-Centric"* action puts a mirror finish on internal combustion engine valve seats in seconds.

PORTABLE GRINDERS . . . Bring the tool to heavy, bulky, hard-to-move work. Perfectly balanced. 3", 5" and 6" wheel diams.

VALVE REFACERS . . . Speedily grind factory-accurate angle on valve faces. Also grind valve stems, tappets and rocker arms for exact clearance.

FACTORY SERVICE . . . A B&D *extra!* Nationwide company-operated branches within 24 hours of *any* customer provide fast, accurate service at reasonable cost!

Industry reports prove . . . for increasing production . . . speedier construction . . . easier maintenance . . . *at lower cost* . . . it's hard to beat Black & Decker Power. They find that in every B&D Portable Electric Tool they get just the right power to do the job.

And they can be sure of getting this right power in B&D Drills, Screw Drivers, Saws, Grinders, etc., because Black & Decker custom builds its own motors. These motors, plus husky housings and precision parts, mean you get a tool that's easy to work with and hard to hurt. In every B&D Tool you have a real time-, trouble-, money-, and manpower-saver.

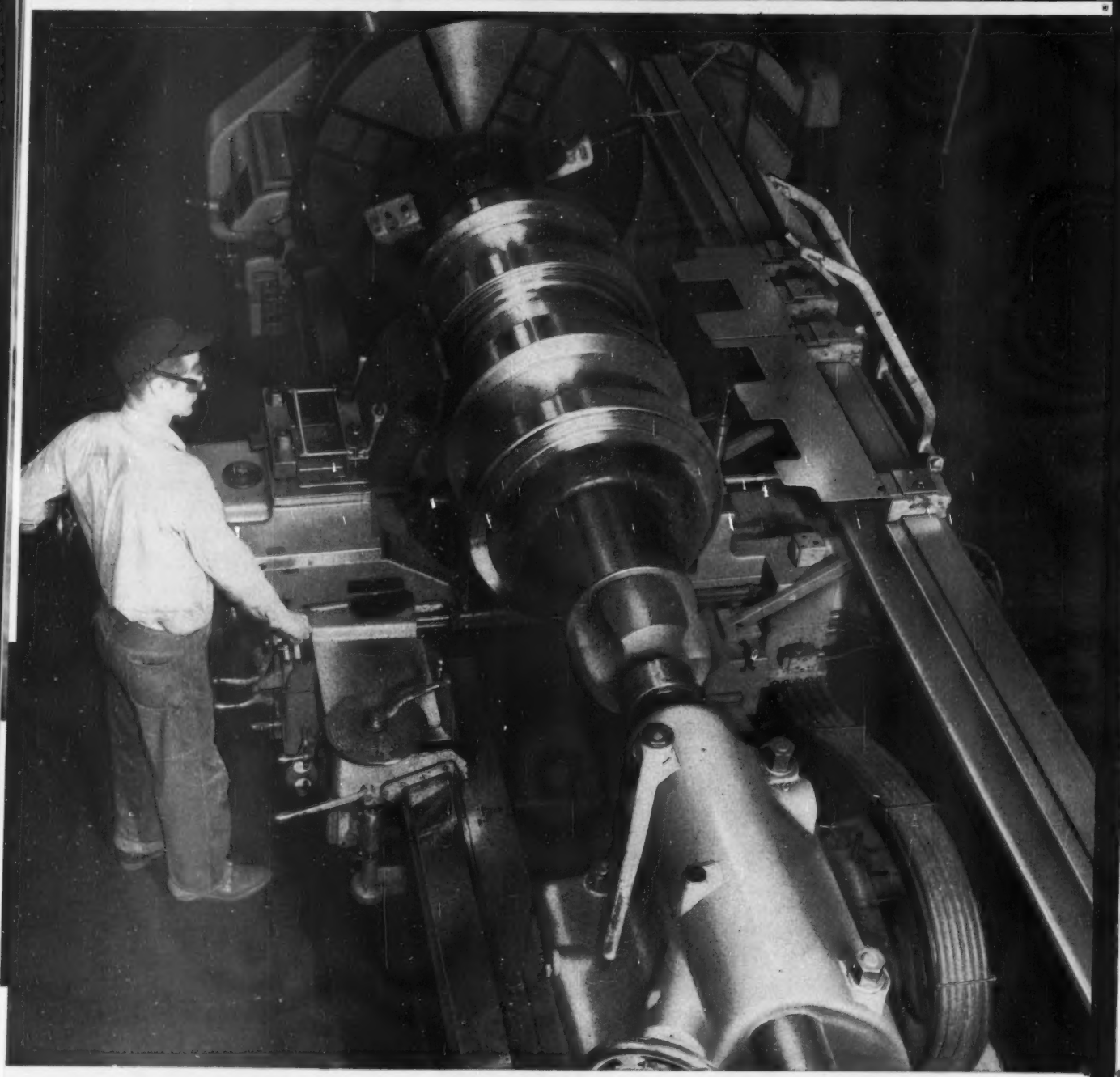
Want more information? Then ask around your industry . . . your own shop. Call your B&D Distributor for demonstration. And write for your copy of the complete *1954* B&D catalog. Address: THE BLACK & DECKER MFG. CO., 604 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker
PORTABLE ELECTRIC TOOLS

* Trade Mark Reg. U. S. Pat. Off.

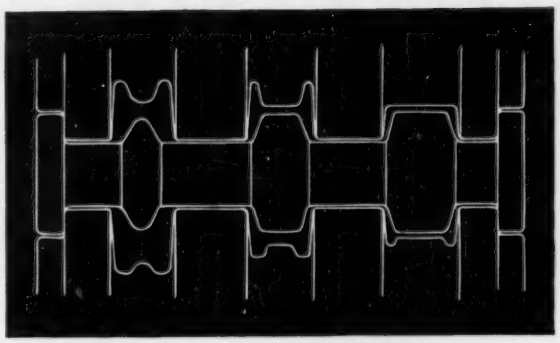
LeBlond Lathe eases cost squeeze ...on rolls that



A set of Shape rolls of 30½" dia. x 51" body cast alloy semi-steel are turned to .005" tolerance in 94 hours on this 50" LeBlond Roll Contouring Lathe. Set-up time: ¼ hour. Clamped-on and brazed-on carbide tips are used at 48 rpm, .040 ipr feed. Conventional roll lathe took 245 hours for the same set of rolls.

squeeze channels from blooms

U. S. Steel Lops 151 Hours Off 245-Hour Roll-Turning Job.



Typical roughing rolls for 8″ channel

Every day at U. S. Steel's Clairton Works, Clairton, Pa., miles of "hotter-than-orange" steel are squeezed through the passes of rolls like these for reduction, elongation, shaping. They come out as finished structural steel for the "jungle-gym" frameworks of modern buildings. Turning these costly shape rolls with their steep-angle contours used to keep a lathe running *245 hours on a set of roughing rolls* at U. S. Steel. Tool life was short and the job required highly skilled operators. Stepped-up schedules called for a new solution to this tough-nut production problem.

A LeBlond 50″ Roll Contouring Lathe, as recommended by Pittsburgh Distributor, Barney Machinery Co., immediately slashed the 245-hour turning time by an astonishing 61.7%. Now U. S. Steel *saves 151 hours on one set of roughing rolls*—more than enough time to turn out two more just like it. Tool life is greatly improved and less experienced operators can handle the work.

The 50″ LeBlond Roll Contouring Lathe is equipped with two-directional hydraulic tracing. A single valve automatically controls two hydraulic motors for cross and length feed. A stylus follows a flat template mounted at the back of the lathe. Feed and speed can be varied during a cut without leaving a tool mark. For roughing, hydraulic cross feed can be by-passed and length feed used separately. This enables operator to cross feed manually, use template as length stop. Mechanical power rapid traverse to carriage and cross slide is also provided. All controls are located conveniently at the apron. The lathe uses a 40 constant horsepower DC motor, has nine speed changes in the headstock, delivers infinitely variable speeds from 1 to 165 rpm.

Whether your turning jobs involve specialized production like roll-turning, or call for high precision, high production—investigate LeBlond's complete line of 76 lathe models. LeBlond engineers will help you get a better turning job, faster. Write today or see your nearby LeBlond Distributor.

Ask for complete information on Roll Contouring Lathes in 25″, 32″, 40″ and 50″ sizes.

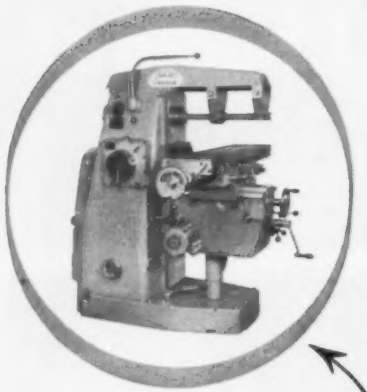
Turned faster by

LeBLOND of Cincinnati

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

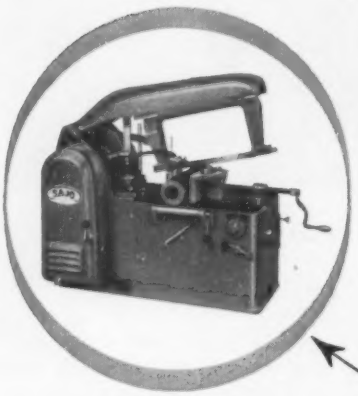
WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 66 YEARS*

Swedish Craftsmanship!



headquarters

FOR THE FINEST SWEDISH MACHINE TOOLS



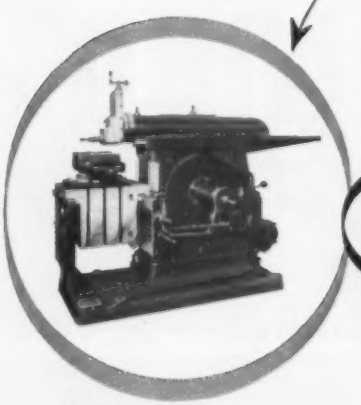
Austin is American headquarters for the fine machine tools that are manufactured in the modern Swedish machine tool center of Värnamo.

Built with the painstaking workmanship and quality materials that characterize Swedish products, these machine tools, since their introduction in the U.S.A., have earned an enviable reputation for accuracy and dependability in toolroom and production line. All machines comply fully with U. S. Standards.

SAJO #2 ALL GEARED MILLING MACHINES — plain and universal models — light and standard types, all built to modern design to meet industry's demand for fast, simplified operation while maintaining maximum accuracy. Available with longitudinal power feed only or with power feed and rapid traverse in all directions. Offered with full line of accessories.

SAJO HYDRAULIC HACKSAWS — Utility and Production Models — 6" x 6", 9" x 9" and 10" x 10" capacities. These sturdy machines, for intermittent or production duty, have unique patented features and are attractively priced. Sajo Hacksaws represent exceptional values in cutting off equipment.

PREMA 13" SHAPER — a "mighty mite" — ideal for applications where large shapers are not justified. "Big Shaper" performance and accuracy at modest cost makes the Prema a profitable addition in the toolroom or on light production work.



VMA SHAPERS are available in both standard and heavy duty models — 14" to 26" length of stroke. These rugged amply powered machines provide speedy set-up, ease of operation and maximum stamina in the toolroom or production line. Automatic lubrication and table power rapid traverse are standard on heavy duty models. Universal table and other accessories are available.

Service and spare parts available from us or from our dealers in principal cities.

For complete details, illustrated catalogs and information as to reference installation in your vicinity write to

austin INDUSTRIAL CORPORATION

76-F MAMARONECK AVENUE, P. O. BOX 430, WHITE PLAINS, N. Y.

Look for the Austin Seal — your full guarantee of satisfaction.

For Those Tough Special Jobs
...Depend on

National Tool Co.

Years of successful experience in special tooling and related production problems are yours for the asking. When the job requires special cutting tools call in your National Tool Co. representative. He is backed by more than 49 years experience in the engineering and manufacture of special cutting tools. His assistance is yours, without obligation, whether you're interested in one tool or a complete tooling program.

Representatives in major industrial centers

Since 1905 engineers and manufacturers of high-quality special cutting tools for the metal-working industry.

National Tools Cleveland

National
TOOL CO.
Cleveland 2, Ohio

Warplis

WHY Warplis STANDS ALONE

Take the steel..... Non-warping oil hardening electric furnace tool steel long favoured for ease of working, for safe hardening, for fine performance . . . for excellent hardness and toughness without appreciable warpage or dimensional change. No worker in fine steel is unfamiliar with this time-tested, non-touchy analysis:

Carbon	.90	Manganese	1.10
Chromium	.50	Tungsten	.50
		Vanadium	.15

the finish..... Grinding—precision grinding—assures extremely close accuracy, uniformity, trueness to section, straightness, freedom from decarb and all defects.

the scope..... Some 400 stock sizes ranging from husky die sections to ribbon-like flats and tenuous squares and rounds.

FLATS & SQUARES — **WARPLIS FLAT STOCK**
Flats 1/64" to 1½" thick X widths up to 12"
Squares 1/8" to 4"

ROUNDS — **WARPLIS DRILL RODS**
1/32" to 2" diameter

the availability.... From "Pittsburgh's" selected distributors coast to coast . . . in quantity for a production run or a single piece for an emergency job.

and the saving.... None of the time and talent of the skilled tool, die or precision parts maker need be spent on get-ready—no metal wasted. Procedures may be simplified . . . guess work removed . . . quality improved . . . time and money saved . . . by standardizing on this single fine grade for all requirements—flats, squares and rounds.

●

See your Warplis distributor or write "Pittsburgh" for descriptive price folders.

Other "Pittsburgh" products

●

ROUNDS

Dukane Drill Rods
water hardening

Monaca Drill Rods
water hardening

High Speed Drill Rods

●

FLATS and SQUARES

Reliance Drill Rods
water hardening

■

Cold finished tool and alloy steels in all sizes and shapes, including odd or irregular sections.

PITTSBURGH TOOL STEEL WIRE CO.

Since 1902 . . . makers of cold finished fine steels in all sizes, grades and shapes

MONACA, PA.

your ideas

your sketches

can become parts

quicker by

Hydroforming

Hydroforming enables you to get into production faster by greatly reducing the time required to convert an "idea" into a finished or prototype part.

With Hydroforming, the "idea" may be presented as a simple sketch, from which the Hydroform tools are quickly made. These tools can be mounted in 10 minutes and part samples then run off, ready for appraisal.

Changes from original part design can be made, incurring minimum tooling costs. The versatility of the Hydroforming method makes it practical to experiment with different kinds and gages of materials using the same tooling.

The problems inherent in producing the actual part may also be studied and solved by Hydroforming a scaled-down version of the actual part, thereby minimizing tooling cost.

Get more facts on how your company can utilize Hydroforming *profitably*. Call in a Cincinnati Milling field engineer. For a description of the Hydroforming process and specifications of the 12″, 19″, 23″, 26″ and 32″ Hydroform machines, write for Bulletin M-1759-2.

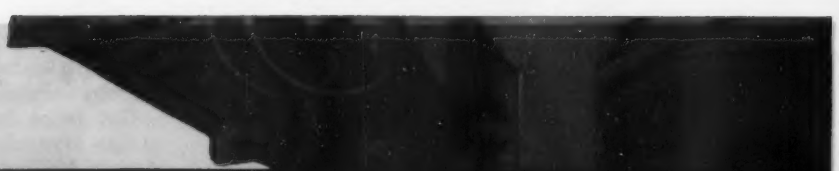
CINCINNATI **Hydroform**

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

Jumbo die

• Short, special purpose, removable upper brackets.

• Large area, removable upper brackets.



CINCINNATI

THE CINCINNATI SHAPER CO.

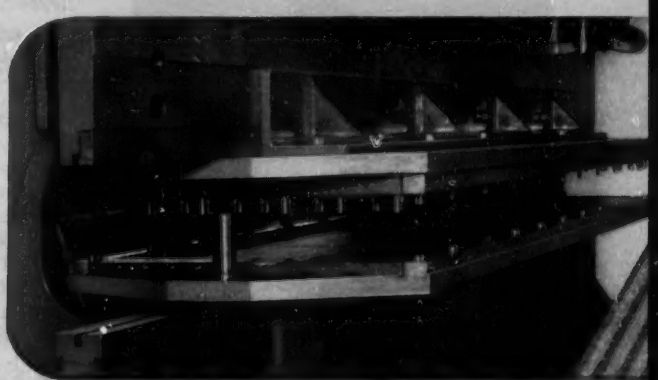
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

areas . . .

on Cincinnati Press Brakes

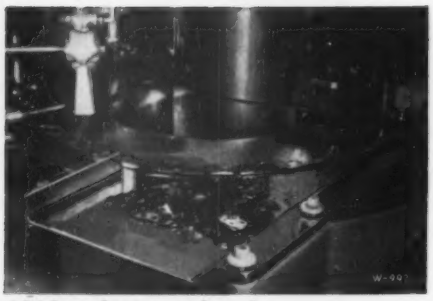
More and more jobs are being done on versatile Cincinnati Press Brakes. Removable or fixed brackets with large die areas permit many jobs to be done both in the Press Brake and Press fields. When dual purpose performance is required removable brackets are used—for Press work only, fixed brackets are furnished. Brackets are designed to sizes desired.

• Large area, permanent wide bed and ram for press work.

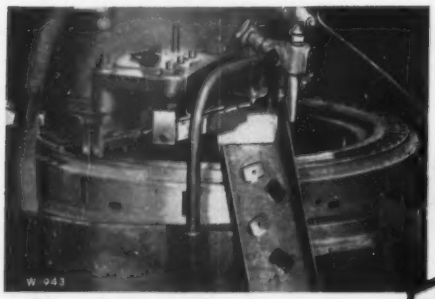


• Large area, removable upper and lower brackets.

Investigate! **Our Engineering Department will be glad to advise you on the profit and production possibilities in your shop. Write for Catalog B-4.**

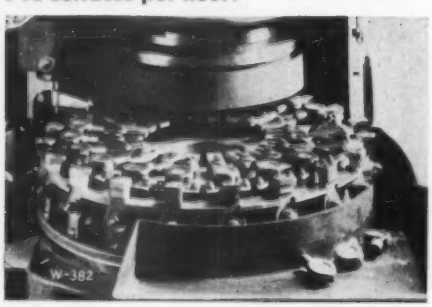


4360 surfaces per hour!



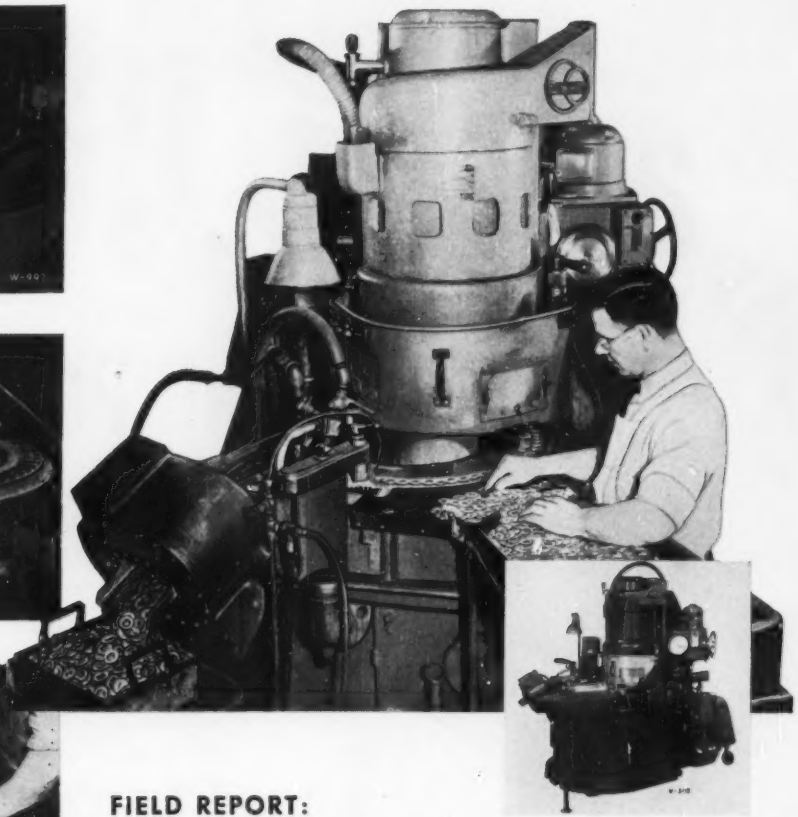
2000 surfaces per hour!

940 surfaces per hour!



900 surfaces per hour!

1400 surfaces per hour!



FIELD REPORT:

... a Blanchard No. 16-1 Surface Grinder saved them $39,000 in 2½ years! (cost approx. $12,500) Their order follows for a Blanchard No. 16-A2!

Here's proof of performance and proof of satisfaction, yet typical of what users expect *and get* from the Blanchard 16-A Surface Grinder. Several typical examples of production rates are shown here. Above, for instance, .003" of stock is being removed from one side of small gears to a tolerance of ±.001" *at a rate of 2100 per hour!* This machine has a 30" chuck and a Blanchard Demagnetizer.

The No. 16-A grinds continuously with a wheel that is set and automatically maintained at a fixed height above chuck face, and finishes one surface of the work to size in one pass under wheel. Operator has only to load the work on the magnetic chuck or in an automatic clamping fixture. A wheel control automatically feeds the head down to compensate for wheel wear. Unloading is usually automatic. Attachments can be supplied for demagnetizing and washing the work as it leaves the grinder. On most work, limits of ±.0005" are readily maintained.

The No. 16-A2 (not shown) has two wheels, each with automatic size control. It roughs and finishes one surface of the work in one pass through the machine.

Send for your free copies of "Work Done on the Blanchard", fourth edition, and "Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

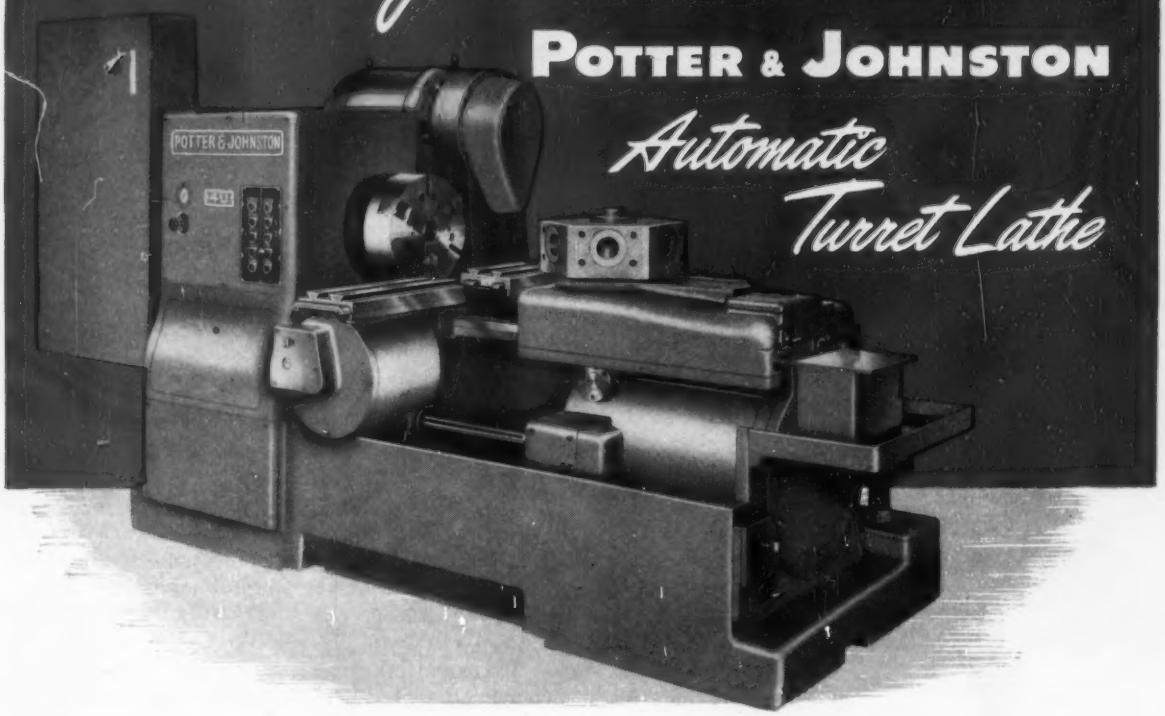
THE BLANCHARD MACHINE CO.

64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.

Introducing THE NEW MODEL 4-U

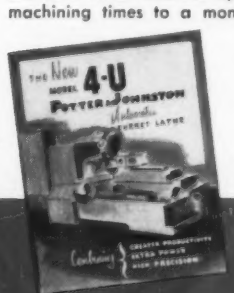
POTTER & JOHNSTON

Automatic Turret Lathe



There's one way to beat today's rising production costs . . . turn out the work faster, more economically. And this new P&J Model 4-U is designed to do just that! It's a tough, rugged workhorse with that EXTRA power that's needed to take full advantage of modern carbide tooling for fast metal removal on the toughest alloys. Want proof? A recently installed 4-U consistently removed **4 pounds of 1118 SAE steel in just 30 seconds** . . . in regular, production line operation.

But speed and toughness aren't all; the 4-U is also extremely versatile and offers unusual opportunities for tooling that will help cut machining times to a money-saving minimum.



SEND NOW FOR COMPLETE INFORMATION

Write direct or contact your nearest Pratt & Whitney Branch Office. Ask for your copy of Bulletin No. 153.

Features

25 HORSEPOWER MOTOR . . . for fast metal removal on the toughest alloys.

CAPACITY . . . chuck sizes: 10"—12"—15"

EXTRA LARGE DOG DRUM . . . reduces set-up time

ALL-CLUTCH DRIVE . . . allows instant starting and stopping of spindle and changes of automatic speeds.

INDEPENDENT FRONT and REAR CROSS SLIDES . . . for added tooling versatility

HEAVY DUTY PRECISION SPINDLE . . . is accurate, *stays* accurate.

BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., PAWTUCKET, RHODE ISLAND

AGENTS: DALLAS, THE STANCO CO. HOUSTON, WESSENDORFF, NELMS & CO.

POTTER & JOHNSTON Co.

PAWTUCKET, RHODE ISLAND

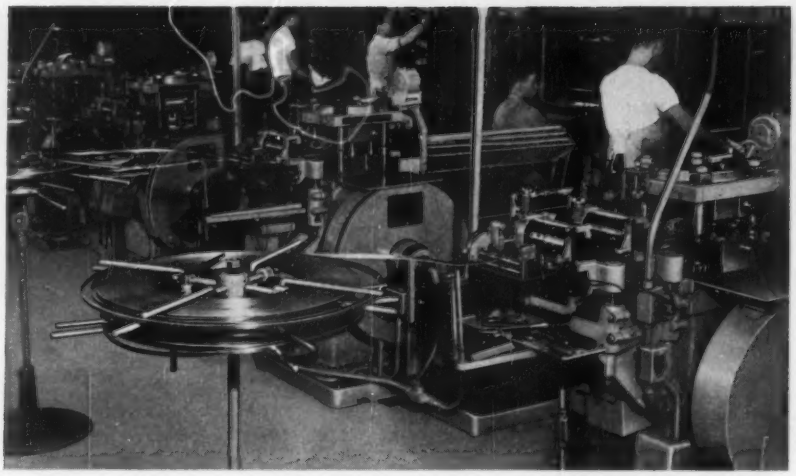
SUBSIDIARY OF

PRATT & WHITNEY

DIVISION NILES – BEMENT – POND COMPANY

COMPETE PROFITABLY / REPLACE WITH P&J

Battery of 25-ton Henry & Wright Dieing Machines equipped with double dies. Barber-Colman also uses 50-ton and 60-ton H & W machines to produce parts for its Air Distribution, Aircraft controls, Overdoor, Small Motor and Textile Divisions.



HENRY & WRIGHT DIEING MACHINES

GIVE BARBER-COLMAN UP TO 470 PIECES A MINUTE

DOUBLE DIE SET UP is used whenever possible by Barber-Colman Company to take full advantage of the high speed and accuracy of Henry & Wright Dieing Machines. Twin dies enable the 25-tonners, when operated at 235 strokes a minute, to stamp out 470 pieces a minute.

More and more leading companies such as Barber-Colman are shifting metal stamping production to Henry & Wright Dieing Machines. The reasons make dollars and cents. One Dieing Machine does the work of five to ten ordinary presses — and that means one operator, one inspection, one trip for parts removal instead of several. You can pull the throttle way out on speed, yet get increased die life and improved precision in your work. Get the whole story about Henry & Wright Dieing Machines and you'll prove to yourself why this most modern of presses delivers . . . A PRICE CUT WITH EVERY STROKE.

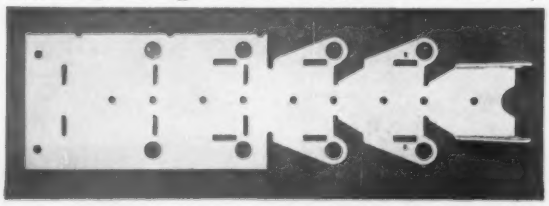
HENRY & WRIGHT

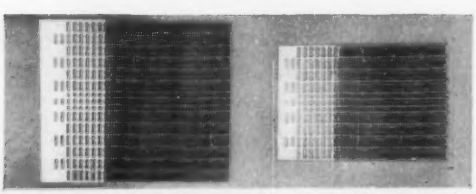
DIVISION OF EMHART MFG. CO.

HARTFORD 1, CONNECTICUT

LATEST CATALOG AVAILABLE — Eye-opening facts about Henry & Wright Dieing Machines. Write for your copy to Henry & Wright, 481 Windsor St., Hartford, Connecticut.

Overdoor part of 3/32" hot rolled steel fed in 5" wide strip.





Air distribution vents stamped out of .018-.020 cold rolled steel in widths ranging from 7¾" to 13¾".

Caterpillar
REG. U.S. PAT. OFF.

gets all these operations

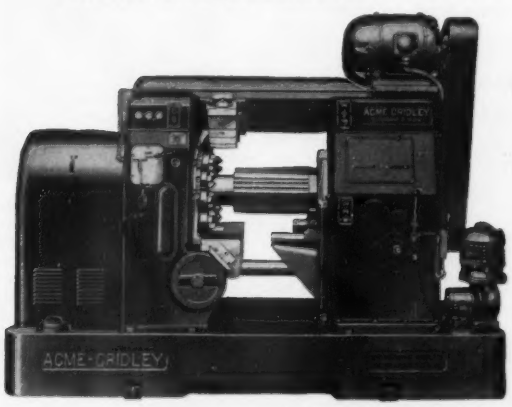
. . . in one time-cycle . . . on a single machine . . . and faster

CATERPILLAR Tractor Company is the world's largest producer of crawler type tractors. As they grow bigger each year, they specify larger heavier, more costly automatic machines—in this case a 20-ton, 8-spindle hydraulic chucker, for repeated runs on the part illustrated as well as others.

A fair question to ask is "Why the investment, why not do the job the single spindle way, or on 4-spindle automatics—why use 8-spindles?"

Plainly because they know the value of man-hours and floor space—have long since proved through comparison of actual cold cost production figures that the lowest machining costs yet possible are obtained by 2-at-a-time planning with

ACME-GRIDLEY 8-SPINDLE AUTOMATIC CHUCKING MACHINES



8 SPINDLE 8" ACME-GRIDLEY CHUCKER—
built also in 4 and 6 spindle models and in sizes 5¼" to 12".

JOB FACTS:

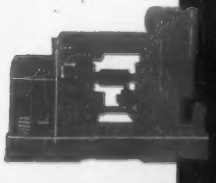
PART—Track Roller Bushing
SIZE—4½" diam. x 2¾" long
MATERIAL—Cast Iron
OPERATIONS—22, Carbide Tooling
MACHINE TIME FOR ALL OPERATIONS—43 seconds, 83 pieces per hour

Here's how they do it...

• the advantages are basically 3...and they interlock —

1. **MORE SPINDLES** — with double index to finish both ends of the piece at the same time—more tools with one machine, one operator and in a cycle time that is always controlled.
2. **BROADER BASE** — adaptability to similar jobs—through interchangeability of tools, attachments, cams and gears—reducing the change-over costs and inventory.
3. **EXPERIENCE AT SOURCE** — Caterpillar knows that Acme-Gridley basic design, stamina and tool engineering to solve new problems are dependable—never let you down.

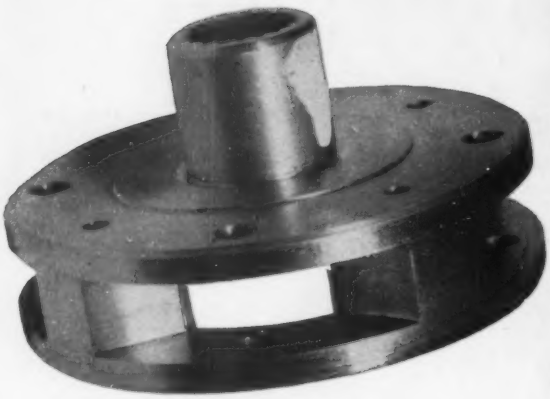
This is just another example among thousands based on our 55 years since we produced the first "multiple." Maybe your chucking problems are simpler, which makes it easier for you and for us. Why not find out, anyway?



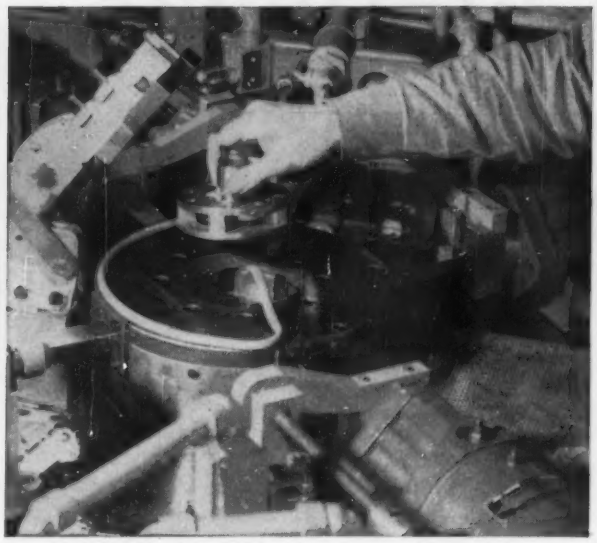
The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS
1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing



This is an automotive turbine part. In producing the piece it was found that after milling, one-eighth inch of stock needed to be removed from each end of the four pinion slots in the part (the stock to be removed is shown by the colored area).



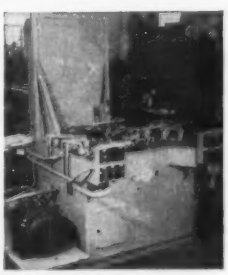
This close-up shows how American engineers attacked the broaching problem. With high production as their goal they devised a machine that would allow all 4 pinion slots to be broached by four radially located reciprocating rams operating in sequence on one fixture.

Special *American* machine helps solve broaching production problem

In nearly every manufacturing operation, sooner or later a metal removing problem occurs that can be solved economically, only by broaching. Usually operations such as these are on high production runs that demand special machines and special techniques. Conventional methods could have been used to remove the small amount of metal required on these automotive turbine parts. But — conventional methods would have greatly reduced production and increased overall time and costs.

American designed a special 4-ton machine to broach the four radial holes of the turbine parts with push broaches. The part is loaded, automatically clamped into place, and then each of the four radially located reciprocating rams working in sequence, push the broaches through the pinion slots and finish the pocket edges. At 100% efficiency the machine can turn out 300 pieces per hour.

Many times production problems such as this one do not require a special machine —but can be handled quite efficiently on a standard American machine. Adapting your problems to American machines is simple work for our engineers. Send us a part-print or sample and your hourly requirements. We'll give you our recommendations with absolutely no obligation on your part. Address Dept. P.



This is the special machine built by American to solve this broaching problem. We can help you, too. Write us today for information on your particular problem or send for Catalog 300. It illustrates and describes standard American machines.

AMERICAN *American* BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

SUNDSTRAND

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

how high is up?

"Up" is the way production must go to offset constantly growing manufacturing costs.

Don't expect your men operating obsolescent equipment to increase your production through sheer physical effort.

Like many other Lodge & Shipley Lathe owners—you, too, can achieve new heights of productivity with the tireless accuracy of these advance-design Lathes.

Consult your local Lodge & Shipley representative or write us for a file of case histories. **The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio**

Lodge & Shipley

....your **LODGE**-*ical choice!*

MODEL "X" LATHES
- ENGINE
- TOOLMAKER
- MANUFACTURING
- GAP
- OIL COUNTRY

COPYMATIC LATHES
DUAL TRACER LATHES
DUOMATIC LATHES
T LATHES

Cut Costs and Increase Efficiency with

HELLER

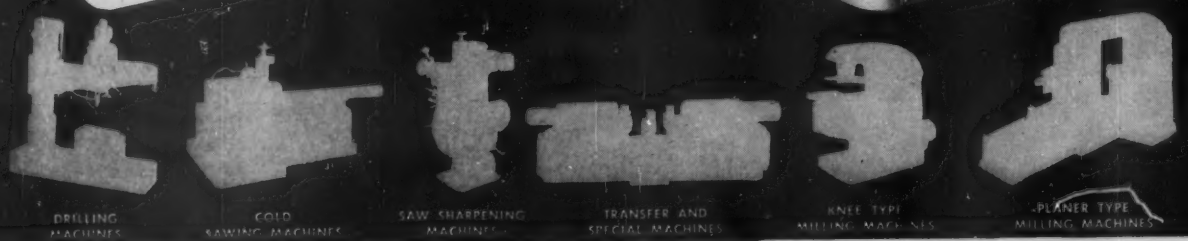
PRODUCTION MILLING MACHINES

HELLER knee type milling machines are available in either horizontal or vertical construction for use with carbide cutters for heavy milling work.

They are rigidly built for the heaviest production milling with powerful drive units with 18 speeds to a roller bearinged spindle.

The control is through push button selection and machines can be furnished standard or equipped with full automatic cycling control or with copy milling control through electro-hydraulic feeler.

Importing Heller Machines Since 1926



HELLER MACHINE CO., 114 Liberty St., New York 6, N. Y.

For Atlantic Automatic Co., Cleveland, Ohio:

Tool Life Increased Over 200%!

PARTS FOR GEARS & CAR TRANSMISSIONS are just a few of the many delicate machine tool products Atlantic turns out. Cities Service Chillo Cutting Oil has helped Atlantic maintain their great reputation for quality products.

For the services of a Cities Service Lubrication Engineer... Write Cities Service Oil Company, Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

"Cities Service Chillo Cutting Oil Has Proved To Be The Difference Between Ordinary And Quality Production In Our Shop!"

Here's Atlantic Automatic's story in their own words: "One of our tougher jobs recently was machining SAE 446 Stainless Steel with two forming, one threading and three drilling operations. The critical operation was drilling a .025 inch diameter hole, ⅛ inch deep. The drill would soon pack with chips and break. When a Cities Service Lubrication Engineer was called in, he recommended our using Chillo 44.

"This light-colored oil did the trick. DOWN TIME WAS CUT IN HALF AND DRILL LIFE INCREASED OVER 200%!

"We use Cities Service Chillo 44 to machine all types of metals covering a range of machinability from brass to stainless on our Brown and Sharpe 00G, 0G and 2G Automatics. It has proved to be the difference between ordinary and quality production in our shop!"

Reduce Inspection Costs– with **Flame-Plated*** Plug and Ring Gages

Steel Gages Flame-Plated with Tungsten Carbide:

- **Outwear chrome-plated gages 20-1**
- **Outwear solid sintered tungsten carbide gages 3-1**
- **Have same thermal expansion as gage base metal**
- **Are highly resistant to chipping and breaking**

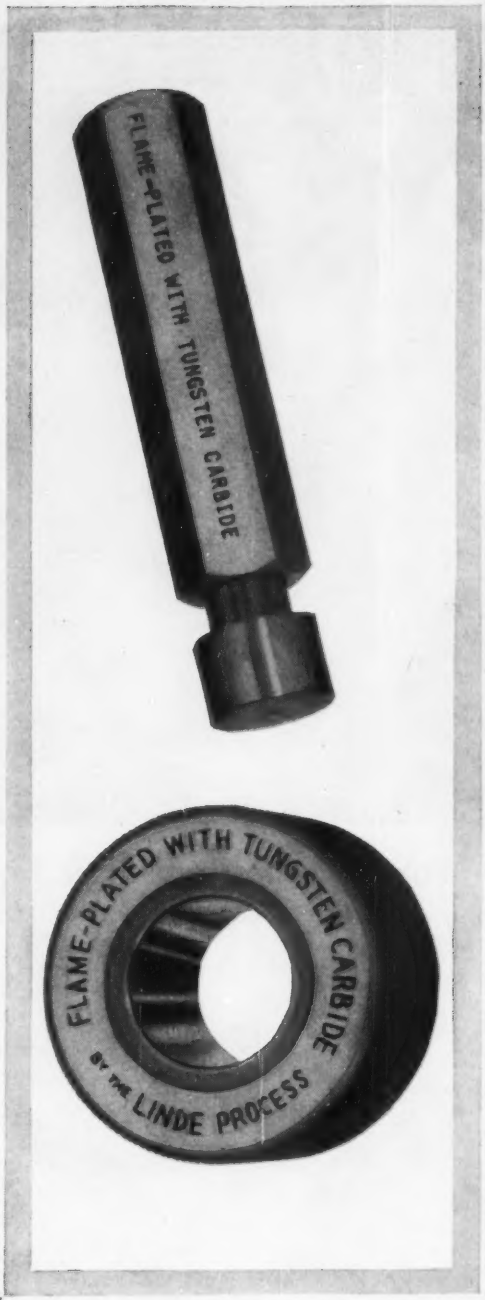
* Flame-Plating is a LINDE process for applying a thin coating of tungsten carbide on the wearing surfaces of gages and hundreds of other parts and tools where high wear-resistant qualities are required.

Cut gage costs to a minimum without sacrificing accuracy. Flame-Plated gages outwear chrome-plated gages 20-1 . . . solid sintered tungsten carbide gages 3-1! Because Flame-Plated steel gages have the same coefficient of thermal expansion as the steel blank, temperature compensation problems are minimized. Flame-Plated gages have a higher resistance to mechanical shock than solid carbide gages.

Flame-Plated plug gages are available in all standard AGD sizes from .059 inch up . . . ring gages from .240 inch up.

Ask your leading gage supplier to show you how you can cut inspection costs with Flame-Plated gages—or call your nearest LINDE office.

For the full Flame-Plating story on gages and other applications, send for your free copy of the "Flame-Plating" booklet today. Just clip coupon below.



The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation

LINDE AIR PRODUCTS COMPANY, Room 308A
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

Please send me your free booklet on Flame-Plating, Form 8065

Name.....Position.....

Firm.....

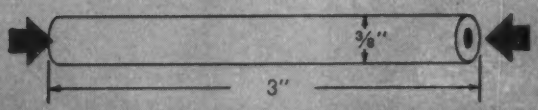
Address.....

City.....State.....

Linde
TRADE-MARK

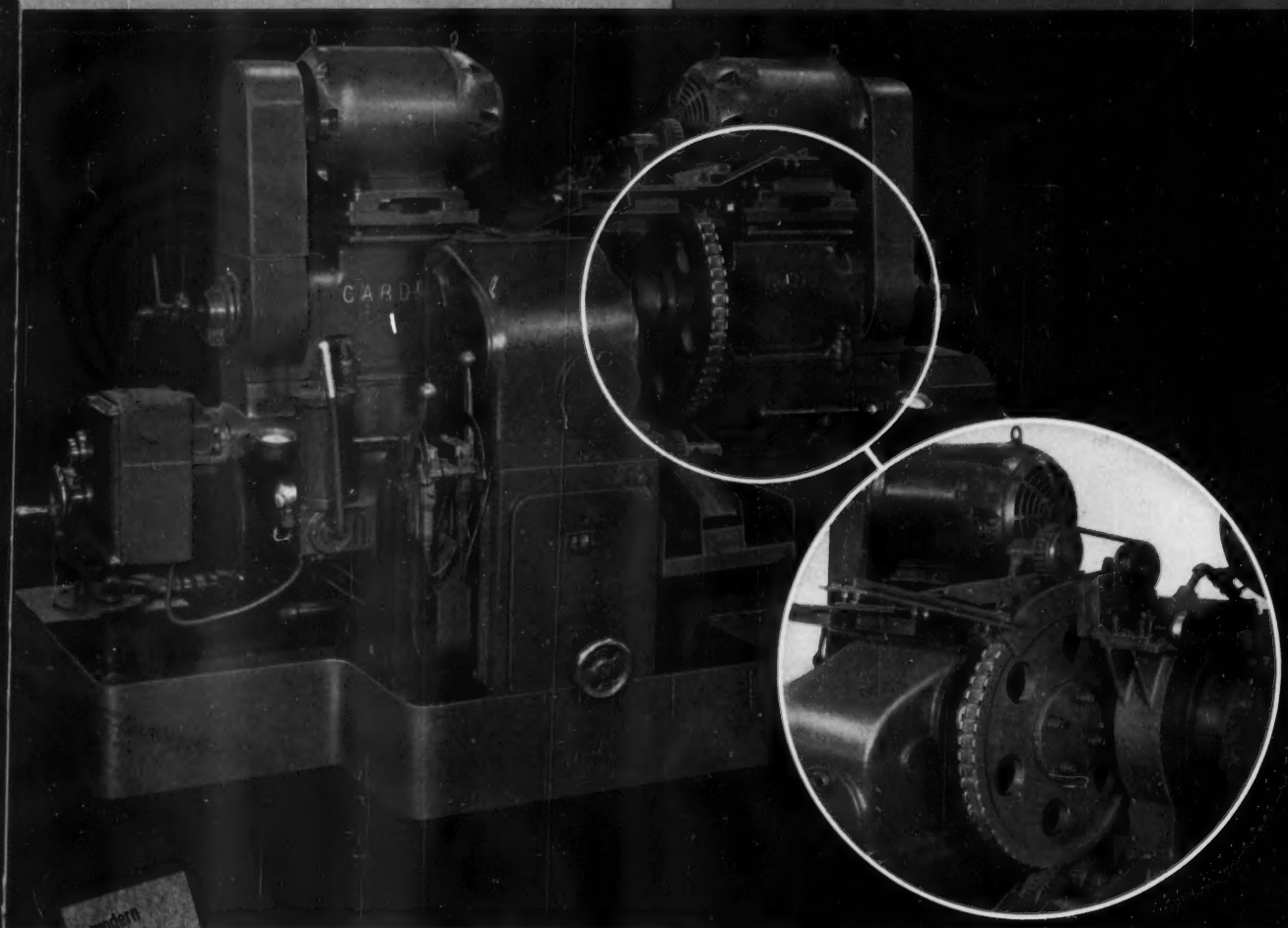
WORK DATA

MACHINE	Gardner No. 115—18" Double Spindle Grinder
TOOLING	Rotary work carrier with gravity feed chute and chain hold down
PART	Electrical relay core
STOCK REMOVAL	Averages .015" to .020" overall
TOLERANCES	.0005" to .001" for flatness, parallelism and squareness; .0015" for uniformity
PRODUCTION	3600 cores per hour



Output of relay cores increases by 20% after modern Gardner Grinder replaces older machine

TWO surfaces ground in **ONE** operation



No. 126M

Write for booklet that gives valuable ideas on how to lower unit costs.

GARDNER MACHINE COMPANY
410 Gardner St., Beloit, Wisconsin, U.S.A.

GARDNER

precision disc Grinders

ANNOUNCING the new BRYANT

BRYANT proudly introduces the newest member of the Bryant family of precision machines — the Bryant 998 Boring Machine — a production machine for precision boring, drilling, turning, facing, grooving and contour turning and boring where fine finish and rapid production are desired.

The Bryant 998 can be tooled either as a single purpose machine for quantity production or for miscellaneous work on small lots. Because it is all-mechanical, its cycle is positive and constant.

Smooth, uniform motion of the table and freedom from vibration, so essential to generating a fine finish with a single point tool, are assured by the 998. Its bed, bridge, heads and table are Meehanite castings. The table moves on preloaded ball bearing slide bars and is mechanically actuated by a simple cam and lever unit. Cam and change gears are easily accessible for changing either the length of stroke or the rate of travel. The motors for driving the cam and the boring heads are mounted in an accessible cavity inside the bed, thus keeping floor space to a minimum. This cavity is fan ventilated.

Ample fixture mounting surface is provided by the table, which measures 17½" x 22". The table has three ½" T-slots, and will accommodate a wide variety of fixtures. Machined setup pads are provided on the bridge for ease in locating fixtures.

The design of the Bryant 998 takes full advantage of standard purchased parts. Brakes, motors, air cylinder, bearings, pneumatic follower system, lubrication hoses and all electrical apparatus are stock items. Either low or high pressure coolant systems are available. All electrical equipment conforms to J. I. C. standards.

BORING MACHINE

Design

- The bed, bridge, table and heads are normalized Meehanite castings.
- The cam actuated table moves on preloaded ball slide bars.
- The cam is hardened and ground.
- The boring head spindles rotate in preloaded super-precision ball bearings. A graduated spindle nose and eccentric bushing for tool setting are standard.
- An air cylinder opposes the work table motion directly with constant pressure and keeps the cam follower roll and the cam always in contact.
- The boring head drive is completely accessible and is designed for long life.
- The cam drive assembly is protected by a torque limiting clutch.
- Cycle time is controlled by precision change gears in the cam drive gear box.
- An ample pad is provided at the rear of the machine for mounting accessory equipment.

Operation

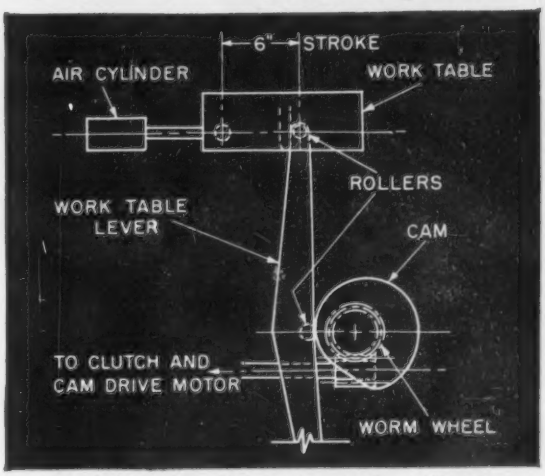
- Push button controls are conveniently located on a panel at the front of the machine.
- Cycle can be manual, semi-automatic or fully automatic.
- An emergency stop button will instantaneously interrupt the cycle.
- Jog buttons are located on both the front and the rear of the machine for setup purposes.
- Machined setup pads are provided on the bridge for ease in locating fixtures.

Maintenance

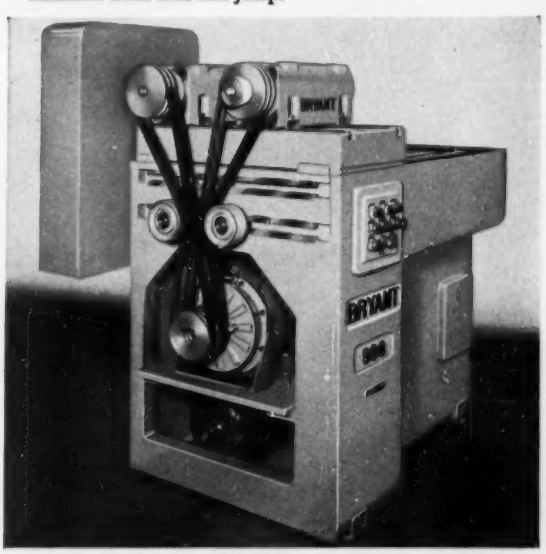
- Maintenance is necessary at only three points: two grease fittings on the cam follower assembly and cleaning and lubricating of the filter-lubricator unit in the pneumatic system.
- The ball slide table is grease sealed.
- Gear box has its own closed lubrication system.
- The boring head bearings are permanently grease sealed.
- The cam is easily accessible for changing the table stroke. It is taper mounted and keyed to the drive shaft to ensure ease of changing and accurate mounting.
- The change gears are enclosed in their own wet sump, splash lubrication system.
- Brakes, motors, air cylinder, bearings, pneumatic follower system, lubrication hoses and all electrical apparatus are standard purchased parts.

Write today for complete information and specifications!

Smooth response of the table is ensured by the special Bryant slide bar design. Each bearing is a hardened steel sleeve containing numerous ¾" diameter preloaded balls. This provides a metal-to-metal contact which resists forces in all directions and transmits stresses directly to the bed.



The table is actuated by an inexpensive, quick-change cam working through a follower and lever arm. An air cylinder opposes the work table motion, keeping the cam follower and the cam always in contact to completely eliminate back-lash and jump.

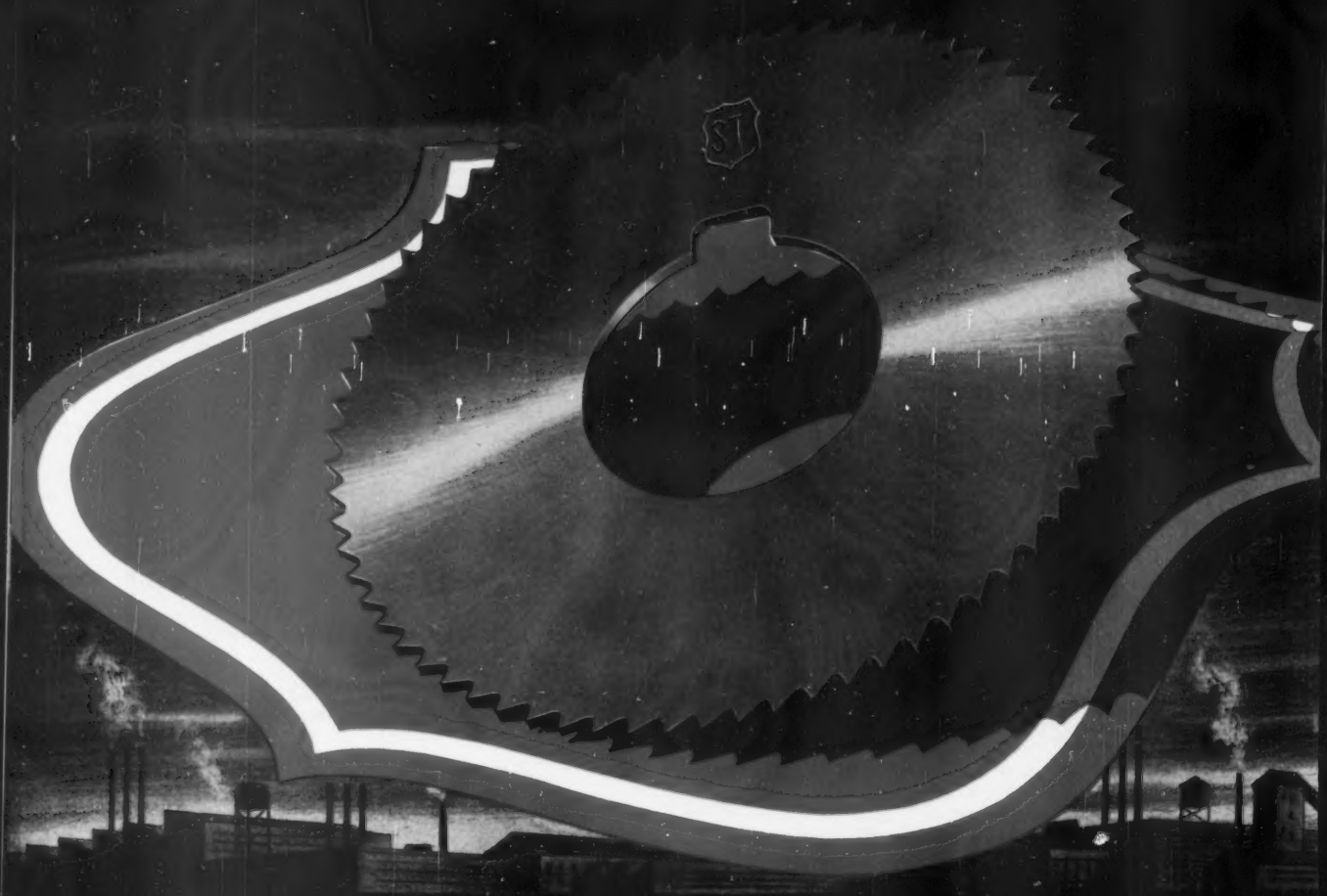


Cam drive and boring head motors are mounted in a well ventilated cavity in the bed.

BRYANT Chucking Grinder Company
Springfield, Vermont, U. S. A.

Internal Grinders, Internal & External Thread Gages, Granite Surface Plates, Boring Machines

"STANDARD for tough jobs since 1881"



Red Shield says:

Call your Industrial Supply Distributor for Shield Brand Slotting Cutters.
Specialized factory service available everywhere.

STANDARD TOOL CO.

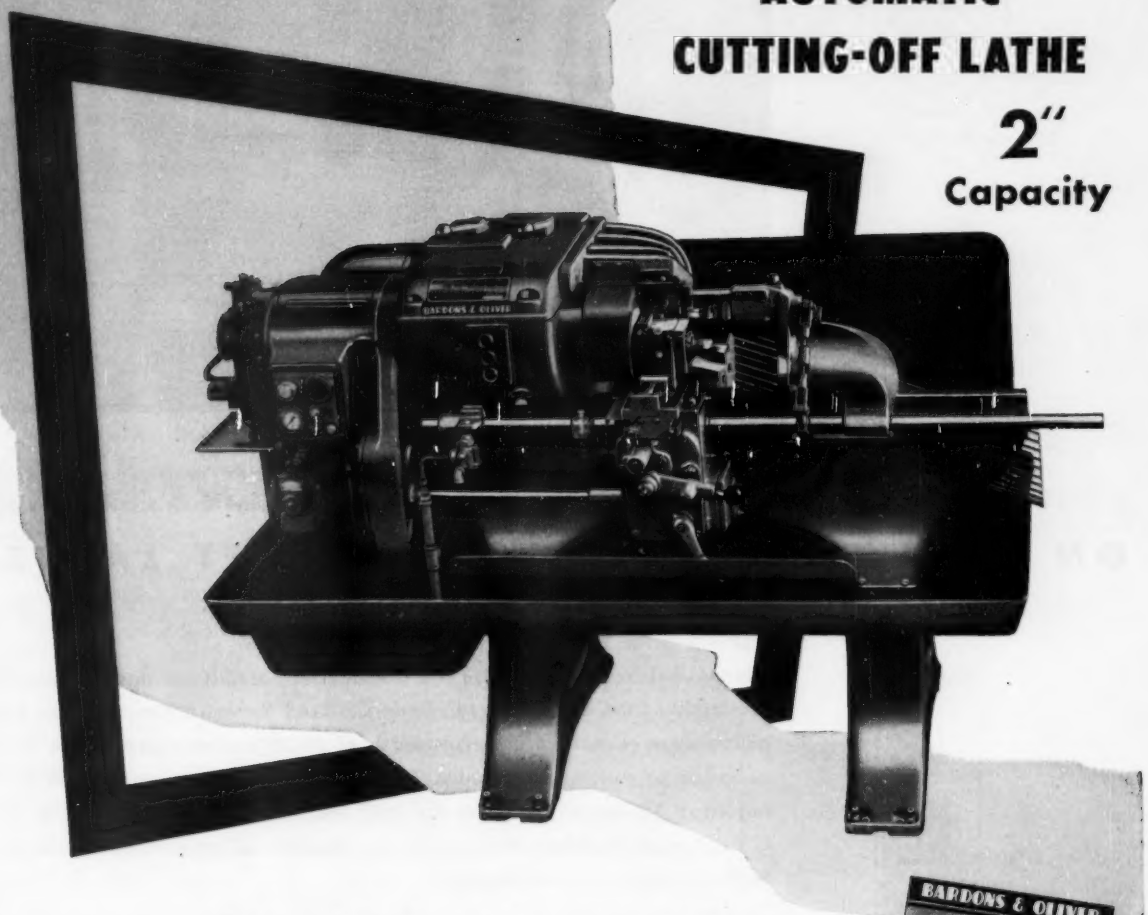
3950 CHESTER AVENUE CLEVELAND 14, OHIO

FACTORY BRANCHES IN: NEW YORK • DETROIT • CHICAGO • DALLAS • SAN FRANCISCO

THE STANDARD LINE: *Twist Drills · Reamers · Taps · Dies · Milling Cutters · End Mills · Hobs · Counterbores · Special Tools*

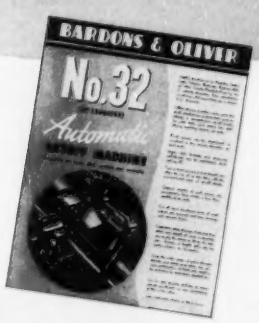
Improved...

BARDONS & OLIVER
MODEL NO. 32
AUTOMATIC
CUTTING-OFF LATHE
2" Capacity



Increased Rigidity and Sturdiness of the entire tool feeding mechanism results in more continuous production and assures a longer, accurate life of the machine.

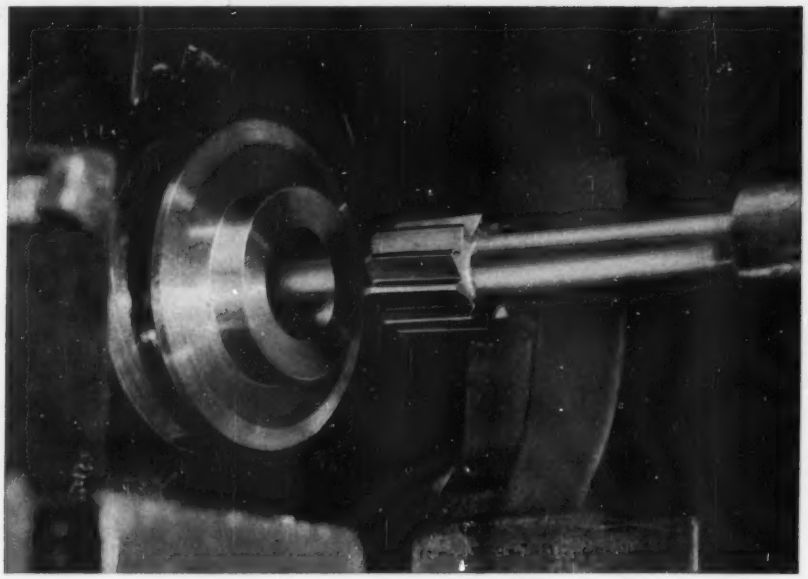
The machine is capable of over 100 cycles per minute . . . its production *AVERAGE* is 30,000 pieces in an 8 hour day. Highly productive for nipples, couplings, ferrules, bushings, spacers, and all other tubular products.



Write us on your company's letterhead for this new Catalog.

BARDONS & OLIVER, INC.

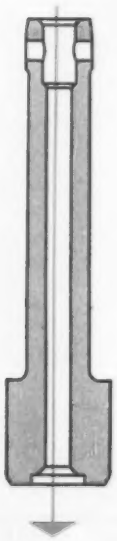
1134 WEST 9TH STREET • CLEVELAND 13, OHIO



REAM FINE FINISHES
ON SCREW MACHINES AND TURRET LATHES

20-25 micro-inch finish

Reamed finishes which were never considered possible are now obtained on production jobs with Barber-Colman Oil-Feed Reamers. On this job, 1000 pieces were reamed to a surface finish of 20-25 micro-inches before it was necessary to sharpen the reamer. The feed is 1.75″ per minute at 280 RPM, requiring 30 seconds to ream the 7/8″ length of cut. The material is AISI C 1137 steel. Finishes like this can be obtained in regular production with Barber-Colman Oil Feed Reamers.



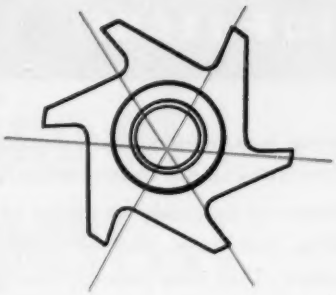
oil feed

An outstanding feature of these oil-feed reamers is that the oil feeds through the body of the reamer to flush the chips away from the cutting area. Other types of reamers tend to pack the chips in front of the reamer, increasing the chance for "pick up" which often ruins the finish and shortens the life of the tool. As the oil hits the end of the hole, it is forced back between the flutes, carrying the chips with it. Another aid to extending tool life is that the oil reaches the cutting area on jobs which could not otherwise effectively employ a free flow of coolant.

DESIGNERS OF STANDARD AND SPECIAL

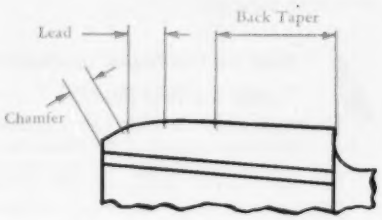
irregularly-spaced flutes

Irregular spacing is a standard feature of all Barber-Colman Oil-Feed Reamers. This type of spacing provides a smooth cutting action and fine finish and prevents the reamer from forming "welts". Thus, the design of the spacing in conjunction with the oil-feed feature allows these reamers to produce surface finishes which formerly required a secondary finishing operation. To aid in checking the reamer diameter, the flutes are spaced diametrically opposite each other so that they can be inspected with a micrometer.



cam-controlled sharpening

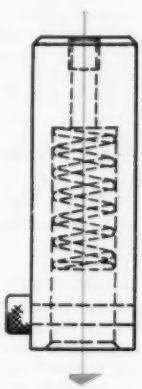
The profile form on the reamer flutes is important in obtaining the best finish and tool life. Following a 30° chamfer, the lead is blended into a radius and followed by a straight portion which irons out the feed marks. This combination produces exceptionally fine finishes. Also, through the use of the Barber-Colman system of sharpening, a theoretically sharp cutting edge is produced rather than a cylindrical land. The Barber-Colman system is cam-controlled so that each reamer is sharpened with exactly the same profile. These are features which are available in no other type of reamer.



self-centering floats

These spring-type floats hold the reamer firmly, eliminating any sagging. Its simple design, consisting of only the holder, drive pin and spring, makes it easy to operate and maintain. An opening through the center of the float allows the oil to reach the reamer. Only two floats are required to cover the complete range of sizes, although a float of extra length is available for the larger sizes. These reamers are available for diameters of .344″ through 1.380″.

Ask for new bulletin listing specifications and prices or call your nearest Barber-Colman representative.



HOBS • CUTTERS • REAMERS
HOBBING MACHINES
HOB SHARPENING MACHINES

BARBER COLMAN

Barber-Colman Company

GENERAL OFFICES AND PLANT, 129 ROCK STREET, ROCKFORD, ILLINOIS, U.S.A.

METAL CUTTING TOOLS SINCE 1908

New Idea . . .
IN TESTING CASTINGS FOR LEAKS

TURNER MACHINE PRESSURE TESTS AND ISOLATES THE LEAK AUTOMATICALLY!

Turner leak-testing machines are adaptable to almost any size or shape production casting!

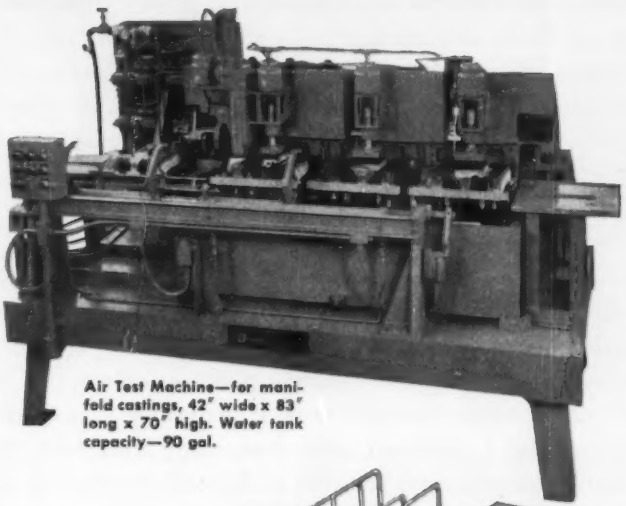
Fixture is specially designed to hold *your* casting, but base and all other parts are standard. That way manufacturing costs are kept at a minimum. You have all the advantages of a machine specially designed for your job, without paying for a special machine design!

Here are two typical applications:

1

Turner Air Test Machine

Designed to leak test manifold castings. Casting is picked up from the automation station, brought into loading position, then transferred automatically to each testing station. When casting is in position in the fixture, the machine clamps it securely in place and seals all openings. By means of air cylinders the casting is then dropped into a 90 gal. water tank and remains submerged for about 15 seconds—allowing the operator ample time to detect and mark any leak. As the checked casting is ejected onto the automation system, the transfer mechanism picks up another casting and the cycle is repeated.

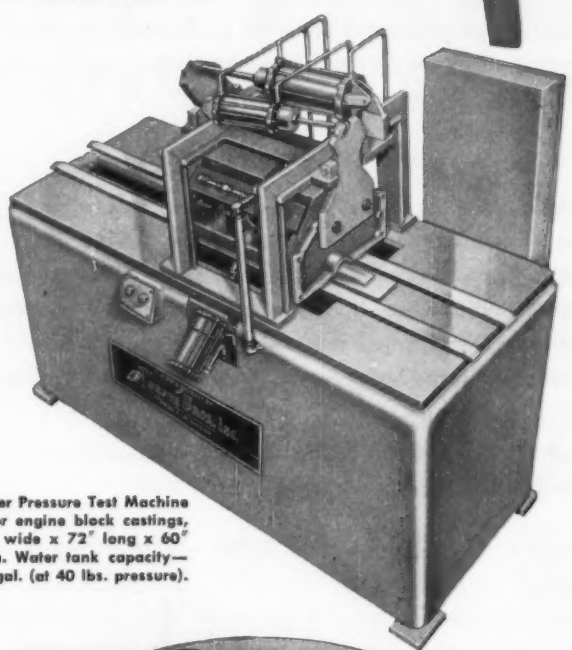


Air Test Machine—for manifold castings, 42″ wide x 83″ long x 70″ high. Water tank capacity—90 gal.

2

Turner Water Pressure Test Machine

Designed to leak test 8-cylinder engine block castings. In this special Turner machine application, engine blocks are manually loaded, but automatically clamped and unclamped in the holding fixture. Water is introduced into the block at 40 lbs. pressure, a force strong enough to allow the operator to visually detect possible leaks anywhere in the casting. For high production, this Turner machine can be equipped with an automatic transfer loading and unloading mechanism.



Water Pressure Test Machine —for engine block castings, 40″ wide x 72″ long x 60″ high. Water tank capacity—50 gal. (at 40 lbs. pressure).

• • •

If you have a production or inspection problem for which you can use to advantage a special purpose machine, write today describing your problem. After our engineering department analyzes it, our field engineer will discuss it with you.

• • •

TURNER BROS. INC.
2625 HILTON ROAD
FERNDALE 20, MICHIGAN

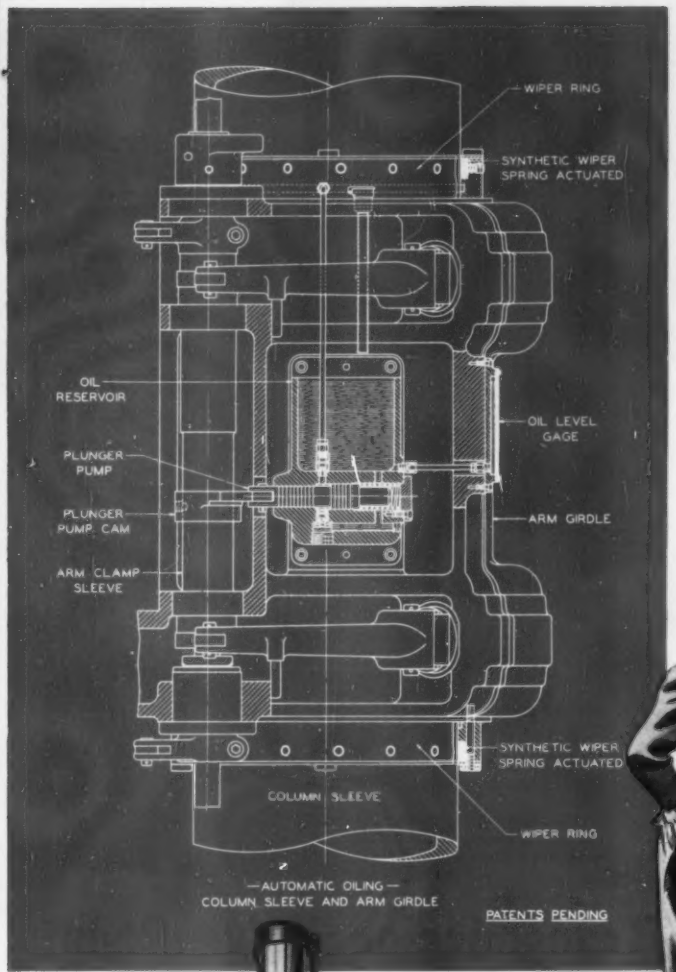
DESIGNERS and BUILDERS of:
- SPECIAL MACHINES
- JIGS and FIXTURES

TURNER BROTHERS

Just a memory now

Column Scoring a thing of the past...

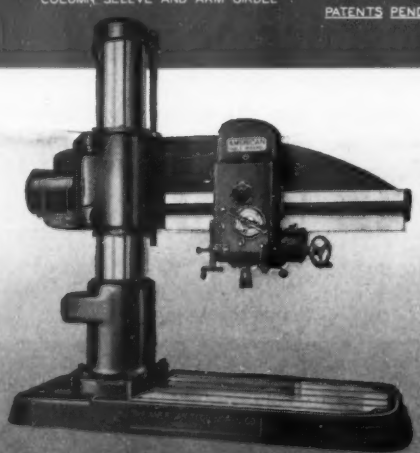
We've done something about it—

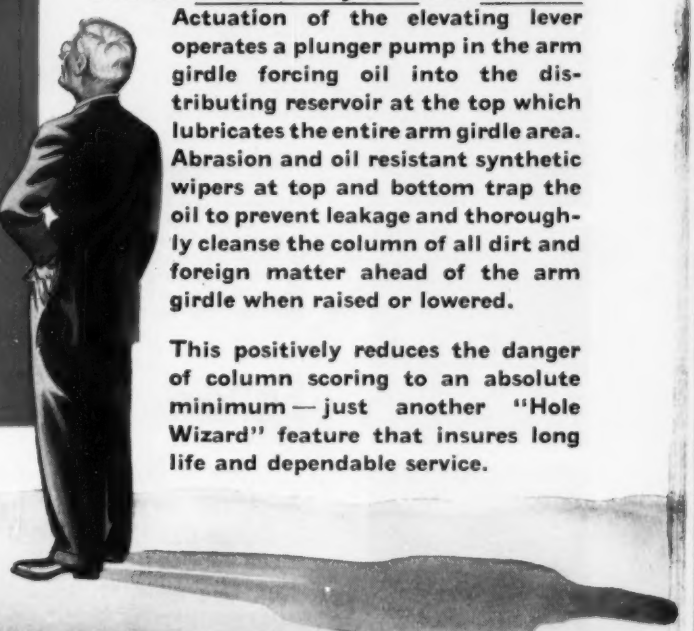


On the new "AMERICAN" Hole Wizard Radial the arm girdle and its mating column area are automatically oiled and cleansed.

Actuation of the elevating lever operates a plunger pump in the arm girdle forcing oil into the distributing reservoir at the top which lubricates the entire arm girdle area. Abrasion and oil resistant synthetic wipers at top and bottom trap the oil to prevent leakage and thoroughly cleanse the column of all dirt and foreign matter ahead of the arm girdle when raised or lowered.

This positively reduces the danger of column scoring to an absolute minimum — just another "Hole Wizard" feature that insures long life and dependable service.





THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

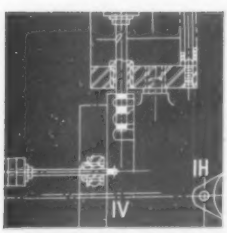
LATHES AND RADIAL DRILLS

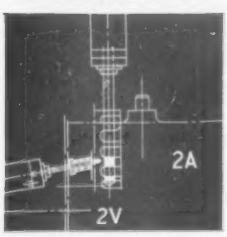
Kingsbury give you

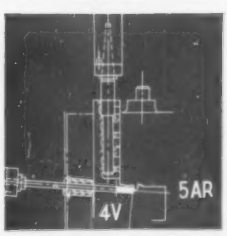
This Kingsbury central column machine has knees for mounting 3 Horizontal (H) Units and 8 Angle (A) Units. The central column mounts 11 Vertical (V) Units, one of which has two heads, one above the work and the other under it (U). Some of the units have multiple spindles. The 60-inch index table has 12 stations — one for loading and unloading.

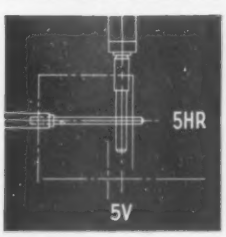
The machine performs 30 operations: drilling, c'boring and reaming. Some of these are illustrated below.

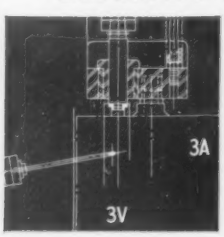
This Kingsbury produces 176 pieces per hour gross at an average cost of 10.26¢ per piece.

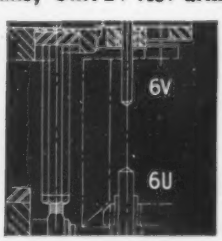


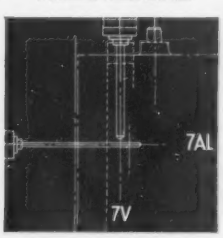


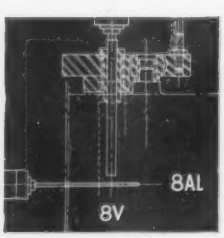












Follow this Transmission Valve Body

Section A: Unit 1H .281 drill — 5 thru-holes.

Section DD: Five vertical and three angle units prepare this long valve hole thru five walls. It must be straight, accurate, parallel with Section EE, and finished ready for borizing. Unit 1V .437 drills thru three walls; Unit 2V .437 drills thru the fifth wall. Units 4V and 5V rough- and semi-finish step-ream the hole. Unit 3V step-c'bores .812 and .640 at entrance to hole.

Angle units finish the port at the fourth wall. Unit 2A .156 drills 1⅝₄ deep; Unit 3A .096 drills thru and Unit 10A .1115 reams this hole.

Special Purpose Machines are custom-built to high production at low cost

Units of 1/2 to 5 hp drill, ream, c'bore, mill, tap, thread — all accurately and economically

Operations are combined to insure accuracy, speed production, save money. The piece is chucked only once. It travels through the machine cycle, stopping successively at stations where Kingsbury Units complete their operations within predetermined time limits. At some stations several units work on the piece simultaneously. The operator loads and unloads the machine — there is no rehandling. Accurate machining reduces scrap. And think of the floor space saved!

If you have a suitable piece which requires a combination of these machining operations, it will pay you to investigate a Kingsbury. We can tell you whether or not we could develop a machine to make the piece in quantity at satisfactory cost. In fact, we would not tackle the job unless we could!

Kingsbury Machine Tool Corp.
102 Laurel Street, Keene, New Hampshire

KINGSBURY

AUTOMATIC DRILLING AND TAPPING MACHINES
for Low-Cost High Production

Forged Aluminum Piston 9.9¢ per part
40 Operations from 40 directions
.125 drill thru — at 25° angle
TOP VIEW IN FIXTURE
12 holes 6 on each side
.125 drill thru
14 holes 9 on each side
.109 drill thru
14 holes 7 on each side
5.44

Forged Aluminum Piston
60 Pieces per Hour Gross — 9-9/10¢ per Piece

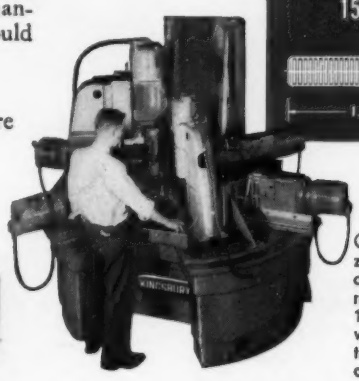
This compact machine has a 60-inch base with 6 units mounted around a central work fixture. Operator loads the part, trips a valve and watches the machine go through an automatic cycle that takes 41 seconds.

The piston indexes on its own axis. First index 26° 15′, then 5 indexes of 14° each to complete 12 angular holes in upper ring groove. Heads 1A & 4A do this work.

Next index 16° then 1 index of 18° and 5 indexes of 14° complete 14 horizontal holes in lower ring groove. Heads 3H & 6H do this work.

Next index 43° 30′, then 6 indexes of 15° to complete 14 horizontal holes in upper ring groove. Heads 2H & 5H do this work.

Now index 26° 15′ to bring work to loading position. Machine stops automatically, job is finished.



Stainless Steel Bolt 1.1¢ per part
15 Operations from 7 directions
Spot drill
.078 drill to center hole
6 holes 60° apart
1.38
.098 drill flat bottom burr ream

Stainless Steel Bolt
460 Pieces per Hour Gross — 1-9/10¢ per Piece

On an 80-inch diameter base, four horizontal and two vertical units spot drill, drill thru, flat-bottom and burr-ream as required. The 12-inch index table has 12 work fixtures, and each rotates clockwise. Work fixtures rotate 90° when the table indexes 30°. Bushing carriers insure accuracy.

through 30 operations — with only one chucking

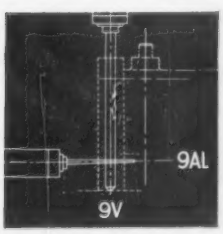
Section EE is another long valve hole thru nine walls, prepared for borizing. Vertical units perform 7 operations.

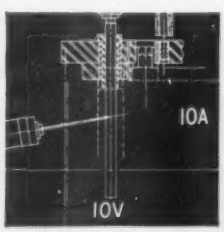
Unit 6V .422 undersize drills down thru two walls. Unit 6U .625 drills up thru ninth wall. Unit 7V .421 drills down thru three more walls. Unit 8V .4531 end-reams the hole thru five walls. Unit 9V .453 drills the hole thru. Units 10V and 11V .4687 rough end-ream and .4882 semi-finish ream the hole.

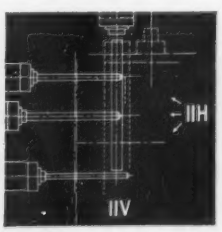
Section FF: Unit at 11H drills .343 dia. and .281 dia. partial holes shown; and four .281 dia. holes not shown.

Section BB: Unit 5H Right .312 drill thru both walls.

Section CC: Unit 5A Right .218 drills hole C1 full depth. Four Units operate on step-hole at C2; Unit 5A Left .060/.065 drills thru; Unit 7A Left .156 drills 17/32 deep; Unit 8A Left .094 drill undersize, and Unit 9A Left .094/.096 reams the hole.







Each Unit Cost on the drawings
includes the cost of the man and of the machine — no power or overhead. We assumed:

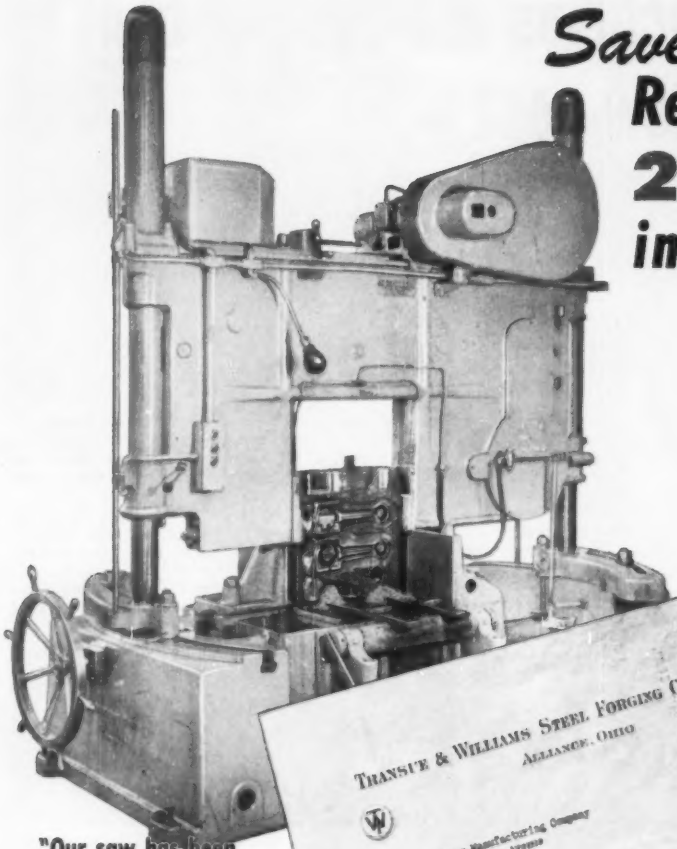
Unit cost of man equal to:

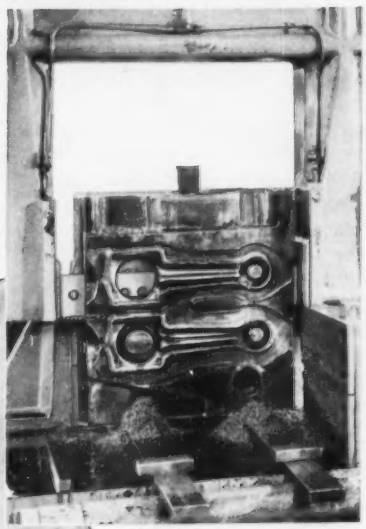
$$\frac{\text{average U. S. hourly wage}}{\text{hourly gross} \times 80\% \text{ efficiency}}$$

Unit cost of machine to be:

$$\frac{\text{price of tooled machine}}{\text{output in 6000 hrs. @ 80\% efficiency}}$$

Save 25% Time in Re-facing Dies... 20% Time -plus steel- in Shanking Them





Trimming the worn impression from the face of a 20" x 24" die block with a No. 24 MARVEL Universal Hydraulic Roll Stroke Hack Sawing Machine. Average Blade Cost $.0108 per square inch.

"Our saw has been in operation 2 years. Most of our sawing has been on die blocks . . ."

"We are removing the worn impression from the face of die blocks for resinking . . . we recently removed 2 inches from face of blocks measuring 19" x 17" . . . sawing time 296 minutes for 2 blocks . . . Set up time 31 minutes . . . grinding time 155 minutes . . . total 8 hours and 2 minutes.

"Average time for removing same amount of stock from these die blocks with planer, 10 hours and 15 minutes. Sawing saves approximately 25% of time . . .

"With regard to removing excess stock to provide shanks . . . we remove approximately 90% of metal by sawing after which block is sent to planer for finishing. Time for sawing and planing is 20% less than planing alone.

"Pieces of stock removed by sawing are useful in many ways . . . saves buying of some trimmer steel."

TRANSUE & WILLIAMS STEEL FORGING CORPORATION
ALLIANCE, OHIO

Armstrong Blum Manufacturing Company
5700 W. Bloomingdale Avenue
Chicago 39, Illinois

Gentlemen:

We felt that you would be interested in having some of the data we have compiled on our 24 x 24 Marvel Metal Cutting Saw. As you know, our saw has now been in operation approximately two years. Most of our sawing has been on die blocks furnished us either by the Bygenstaff Company or A. Finzl & Sons Company.

We wish to advise you that we are removing the worn impression from the face of die blocks for resinking with the use of this saw and find that it works to a very definite advantage, depending somewhat on the amount of stock to be removed from the face of the die. On a job which we recently removed two inches from the face of blocks measuring 19 x 17", our sawing time was 296 minutes for the two blocks, set-up time was 31 minutes, and the time required for grinding the face after sawing was 155 minutes, total 482 minutes or 8 hours and 2 minutes. To remove the same amount of stock from these blocks with our planers, over an average of eight sets of dies required 10 hours and 15 minutes for planing and grinding, or approximately 25% additional time. We might point out that our labor rate for a saw operator is less than that being paid to a planer operator, which increases the saving somewhat. From our experience, we find where only one inch is to be removed from the face of the die, the saving is somewhat less, but in our case has been very definitely in favor of the saw.

With regard to removing the excess stock to provide shanks on our dies, this naturally varies with the size of blocks and the depth of the shank involved. However, our average over a year and a half period has indicated to us a saving of 20%; in other words, we remove approximately 90% of the metal by sawing, after which the blocks are sent to the planer for finishing the shanks. The total elapsed time for the sawing and planing we have found to be 20% less than that required by planing alone. We should also like to point out that the pieces of stock removed by the sawing operation are useful in many ways and has eliminated the necessity of buying some of our trimmer steel.

Perhaps you also would be interested in our blade life and blade cost. We have found that with an original blade and having it reground twice, we are able to cut 2,855 square inches. The cost of the blade being as

...of this ...would be.

...Shire,

...STEEL FORGING CORPORATION

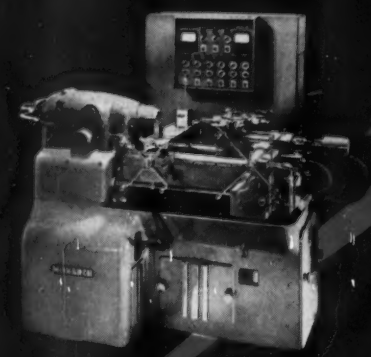
Factory Manager

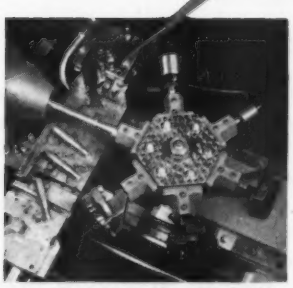
Write for Catalog of MARVEL Modern Metal Saws

Metal Cutting
MARVEL SAWS
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 W. BLOOMINGDALE AVE. CHICAGO, (39) U. S. A.

FEED AND SPEED CHANGE—
LIGHTNING-QUICK!





Part—Clamp Post; Material—X-1315 Steel; Preselected Spindle Speeds—5; Cuts required—10; Time per piece—40 seconds; Setup Time—35 minutes.

PRESELECT Any 9 Spindle Speeds...40-4000 rpm Any 6 Feeds...⅛"-16" per min. AND PRODUCE!

For peak screw machine production, take a good look at the Monarch Speedi-Matic. This electronically-controlled lathe, with instant preselected speed and feed changes in a wide stepless range, saves as much as 50% on production times. Add its average *45 minute* setup time—without feed cams, and you see why it has proved unbeatable in runs of 25 to 2000 or more pieces.

The preselected speed and feed settings can be made for all six turret stations; the preselected speed settings for cross feed slide operations. Being wide in range and infinitely variable, they provide better finishes and closer tolerances—toolroom accuracy at production line speeds.

The Speedi-Matic, to repeat, stands for speed—with Monarch standards. It has won a name in metal-working circles as "The world's fastest hand screw machine." And we've got performance records and job data to back up that name—all neatly presented, with specifications and complete information, in our illustrated Booklet No. 1903. For this booklet—or information on other Monarch turning equipment—simply write us on your letterhead . . . *The Monarch Machine Tool Co., Sidney, Ohio.*

SPEEDI-MATIC FEATURES

- Automatic electronic speed change, preselected for as many as nine stations.
- Automatic electronic feed change, preselected for as many as six stations.
- Infinitely variable range of spindle speeds—40 to 4000 rpm.
- Feeds from ⅛" to 16" per minute.
- Quick-acting, spring-return, hand-operated cut-off slide.
- Air-fed pusher-type collet attachment.
- Collet chuck capacity—⅜".

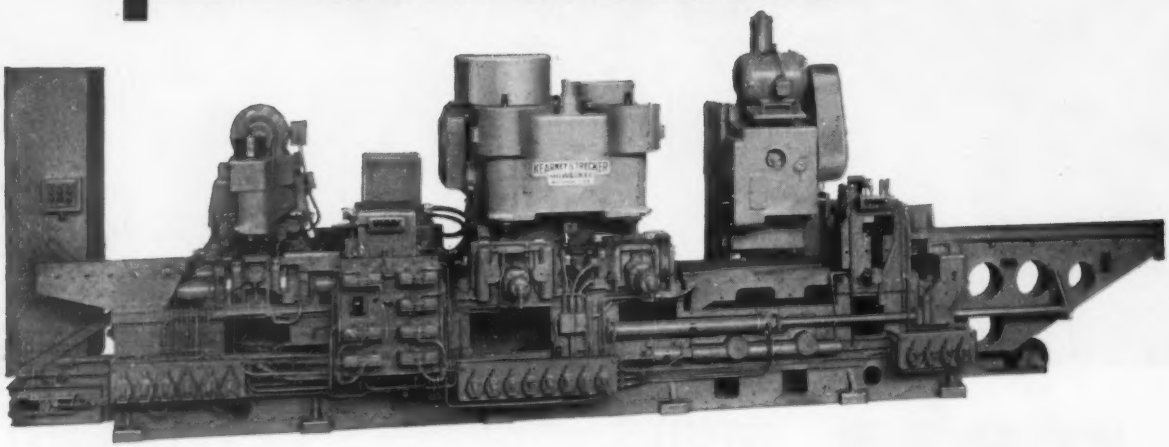
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Monarch TURNING MACHINES

ACCURACY • ECONOMY • LONG LIFE

Talk about production...

Builders of Precision and Production Machine Tools since 1898

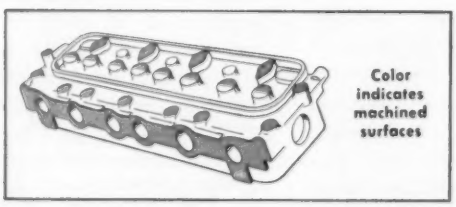


For the customer...

it put a one-at-a-time rough and finish milling job on a production basis!

THIS special seven-station traveling head transfer type milling machine solved an automotive manufacturer's problem that involved milling cylinder heads. Formerly, rough and finish milling of a six-cylinder head required six distinct machining operations and seven separate handlings. Now, by combining all the machining operations and eliminating handling... the special machine produces 62 finished pieces per hour.

TRAVELING HEADS . . . three heads — one with one spindle and two with three spindles. Full quill adjustment on all spindles. Speeds are fixed. Heads travel hydraulically on hardened and ground ways.



Color indicates machined surfaces

Capacity . . . Experience . . . Performance

Upon completion of this $5,200,000 expansion of our Special Machinery Division, we offer you (1) unmatched facilities, (2) experience based upon more than 50 years in the design and production of special machinery, and (3) performance, best recommended by our outstanding record of successfully solving many hundreds of unusual machining problems.

For more details on this machine . . .

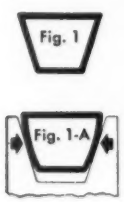
ask for *Data Sheet No. 1003.* Free booklet, "Doorway to a proven method for solution of big and small metalworking problems" is also yours for the asking. *Write today to* SPECIAL MACHINERY DIVISION, KEARNEY & TRECKER CORP., 6784 West National Ave., Milwaukee 14, Wisconsin.

KEARNEY & TRECKER CORP. · *Special Machinery Division*
MILWAUKEE 14, WIS., U. S. A.

Why V-Belts with CONCAVE SIDES Last Longer!

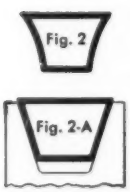
(U.S. PAT. NO. 1813698)

Prove this yourself!



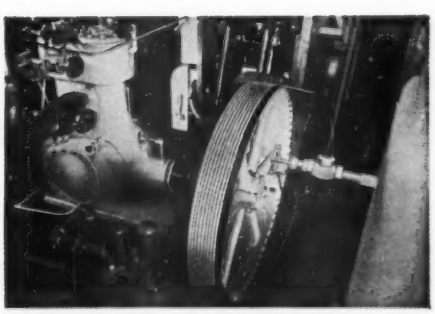
Take any *straight-sided* V-Belt (Fig. 1). Bend it—as it bends in going around a pulley. The sides will at once *bulge out* (Fig. 1-A). Clearly, those bulging sides will press *unevenly* against the V-pulley—and this causes *extra wear* at the points shown by the arrows (Fig. 1-A).

Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)



Instead of *bulging*, the precisely engineered CONCAVE SIDES merely *fill out* to *fit exactly* in the sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means *longer* belt life and *lower belt costs* for you!

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE Sides—the Gates Vulco Rope!



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

Gates VULCO ROPE DRIVES

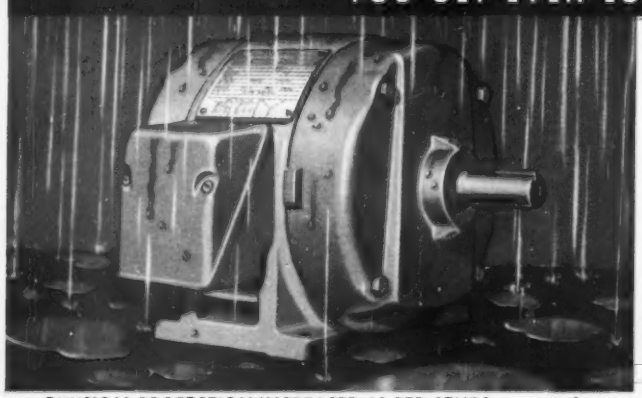
REG. U. S. PAT. OFF.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

THE GATES RUBBER COMPANY
DENVER, U.S.A.

CS-585

YOU GET EVEN LONGER MOTOR LIFE



PHYSICAL PROTECTION INCREASED 60 PER-CENT by a complete redesign of cast-iron frame and end shields. This motor is suitable for many jobs where ordinary dripproof motors should not be applied.

EXTRA ELECTRICAL STRENGTH is assured by use of new polyester film insulation. A silicone coating, Dri-film,* virtually eliminates stator insulation failure caused by moisture.

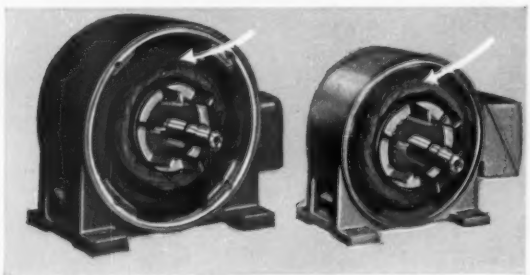
*REG. U.S. PAT. OFF.

TRI 55 CLAD REG. U.S. PAT. OFF. THE LEADER IN MODERN MOTOR DESIGN

GENERAL ELECTRIC ANNOUNCES...

THE ALL-NEW TRI 55 CLAD MOTOR

REG. U.S. PAT. OFF.



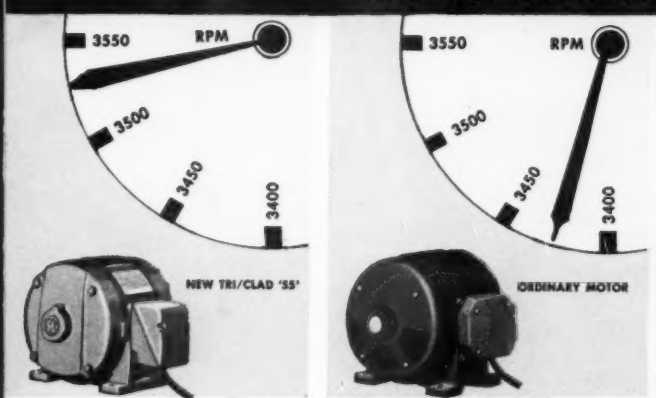
LIGHTER, SMALLER Tri/Clad '55' motors have been made possible through better use of space within the frame. Active materials (magnetic steel, copper) have not been sacrificed.

Complete Line of Dripproof, Enclosed Motors and Gear-Motors Available in Most Ratings in 1954

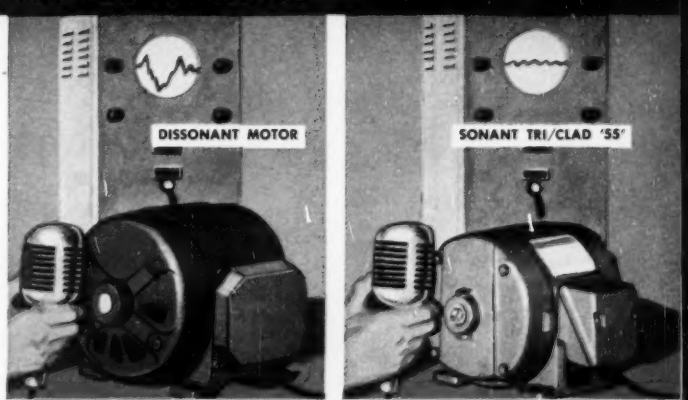
Here's the all-new Tri/Clad '55' motor — now available in NEMA 182 and 184 frame sizes.

You can get complete information on this dramatic motor achievement by writing for bulletin GEA-6013 on Tri/Clad '55' Dripproof motors, GEA-6012 on Tri/Clad '55' Enclosed motors, or GEA-6027 on Tri/Clad '55' Gear-motors, or by contacting your nearby G-E Apparatus Sales Office or G-E Motor Agent. General Electric Company, Section 648-1, Schenectady 5, N. Y.

YOU GET EVEN BETTER PERFORMANCE



HIGHER FULL-LOAD SPEEDS is only one of many improved characteristics of this new G.E. motor. Above shows comparison of an ordinary motor with the Tri/Clad '55' — both rated at 3600 rpm.



SONANT OPERATION of the new Tri/Clad '55' motor has been laboratory tested and proven. Motor operates at reduced noise level, and operating sound is pitched to a more pleasant frequency.

YOU GET EVEN MORE INSTALLATION AND MAINTENANCE SAVINGS

NEW BEARING SYSTEM allows this motor to run longer than other motors without regreasing. One reason—greatly improved synthesized grease with 8 times the mechanical stability of ordinary grease.

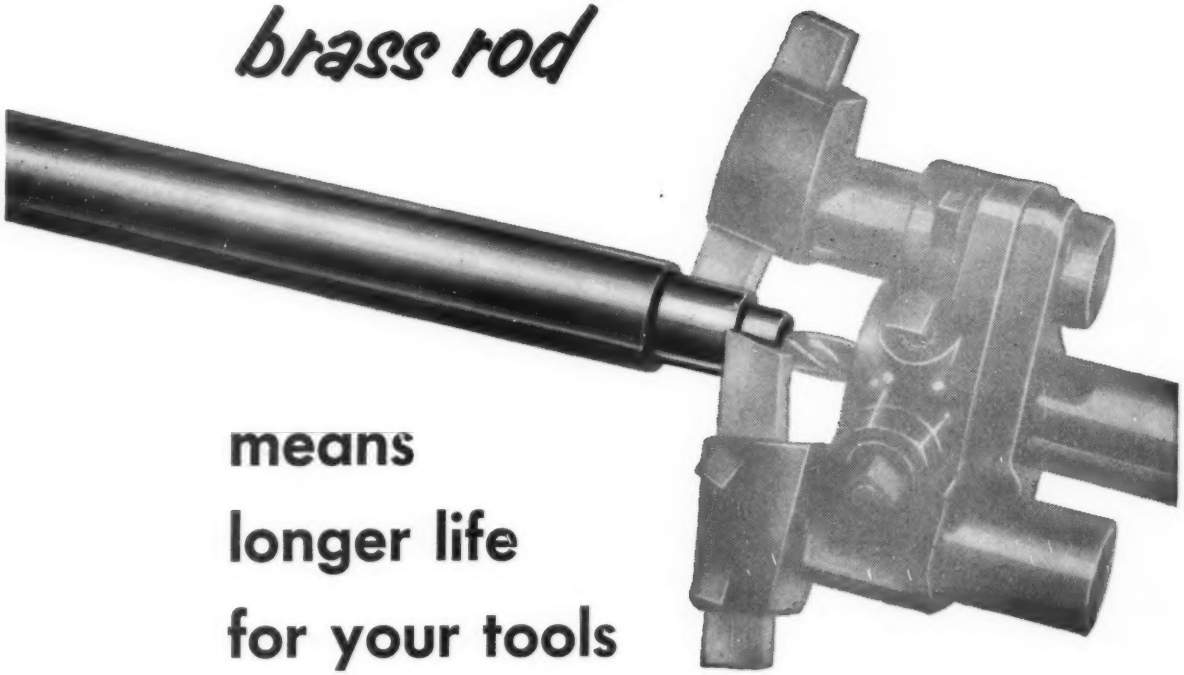
EASIER TO SERVICE, the new Tri/Clad '55' has larger conduit box diagonally split for simplified wiring. Perma-numbered leads mean that even clipped and stripped wires are instantly identified.

Progress is our most important product

GENERAL ELECTRIC

CHASE®

free-cutting brass rod



means longer life for your tools

Chase Free-Cutting Brass rod yields short chips as it is machined. The result is much easier cutting, longer tool life. Products produced are smoother, cleaner-surfaced, less expensive to buff or polish before lacquering, enameling or plating.

Fine quality Chase rod and drawn bar are available in a wide variety of free-cutting copper alloys. They are always uniform so that repeat orders have the same cutting characteristics.

For rod and bar, for finer products at lower unit cost, call the Chase warehouse nearest you.

Chase® **BRASS & COPPER**

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

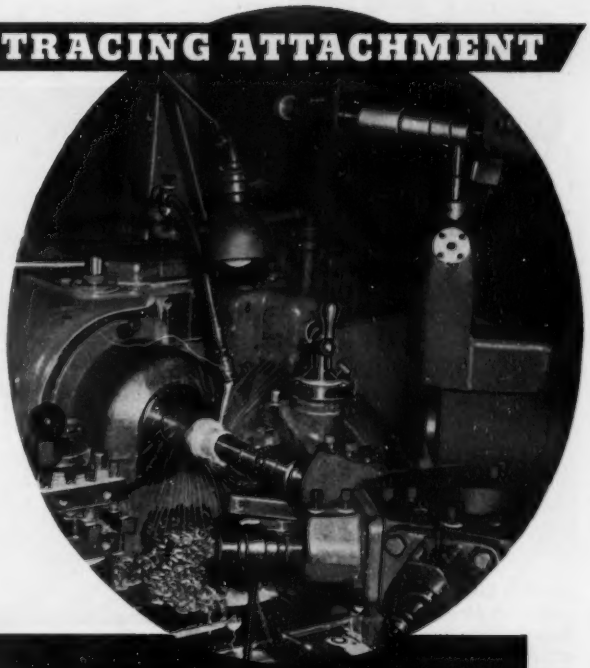
The Nation's Headquarters for Brass & Copper

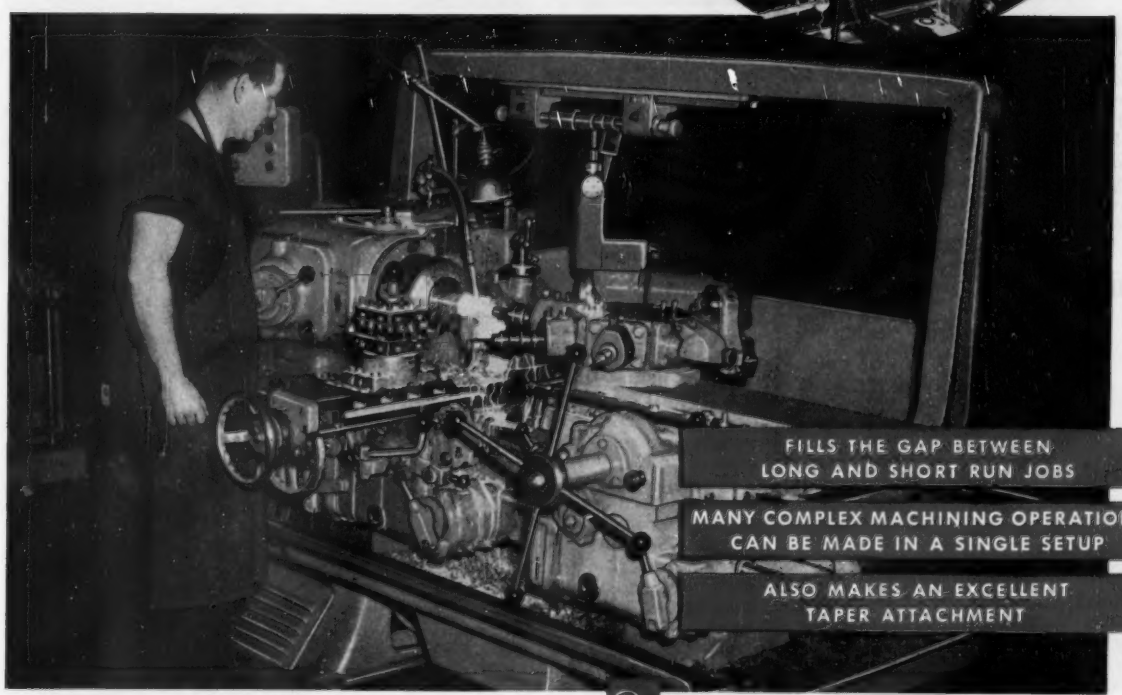
Albany†	Cleveland	Kansas City, Mo.	New York	San Francisco
Atlanta	Dallas	Los Angeles	Philadelphia	Seattle
Baltimore	Denver†	Milwaukee	Pittsburgh	Waterbury
Boston	Detroit	Minneapolis	Providence	
Chicago	Houston	Newark	Rochester†	(†sales
Cincinnati	Indianapolis	New Orleans	St. Louis	office only)

NEW HYDRAULIC TRACING ATTACHMENT

for J&L turret lathes*

Will reduce your costs —direct and indirect— by combining in a single machine all the advantages of TRACING for contour turning, boring or facing operations, with the advantages of multiple tooling and the many other time saving, cost saving features of J & L Universal Turret Lathes.





FILLS THE GAP BETWEEN LONG AND SHORT RUN JOBS

MANY COMPLEX MACHINING OPERATIONS CAN BE MADE IN A SINGLE SETUP

ALSO MAKES AN EXCELLENT TAPER ATTACHMENT

RAM TYPE or No. 7 SADDLE TYPE

P.S. This attachment can be purchased with new machines or installed in the field on machines now in service. Write for descriptive leaflet giving complete specifications.

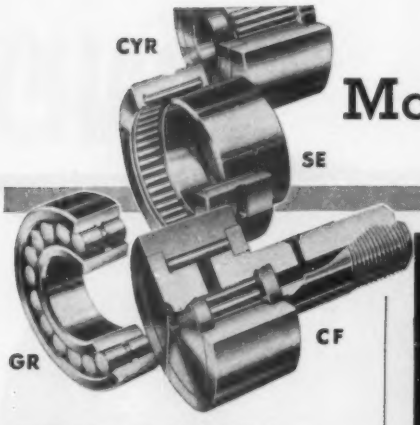
JONES & LAMSON

Machine Tool Craftsmen Since 1835

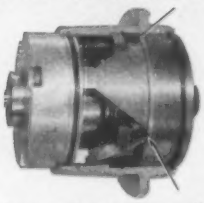
JONES & LAMSON MACHINE CO., 502 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

J&L TURRET LATHE DIV.

McGILL BEARING BRIEFS

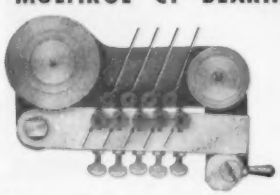


MULTIROL CF BEARINGS PROVIDE POSITIVE CAM ACTION IN ANCHOR CUT-OUT

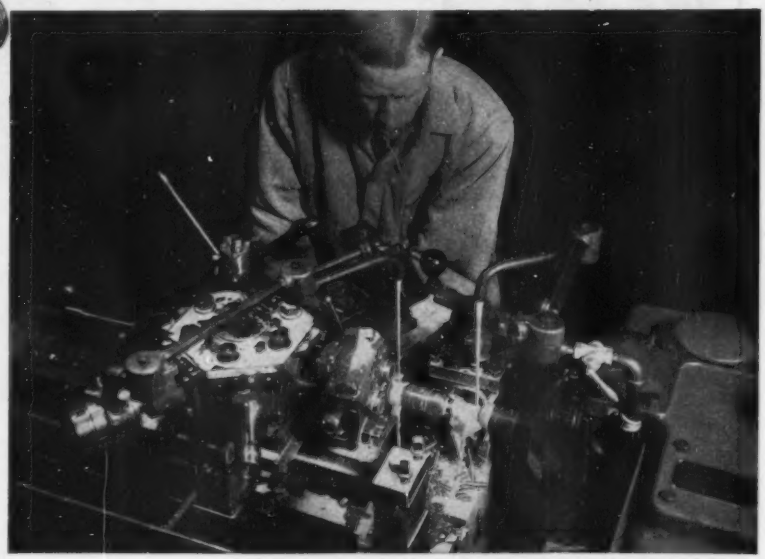


Anchor Steel and Conveyor Company relies on Multirol Cam Follower Bearings for positive and instant operation of Anchor cut-out couplings. When dangerous overload occurs this torque sensitive coupling cuts power when a spring loaded sliding sleeve is actuated by forcing CF series bearings up the inclined faces of a circular cam. Shock load capacity and dependability of CF series bearings combine to help the Anchor Company protect motors and machinery from damage due to overload.

SJOGREN KILLERS CAST WIRE ON MULTIROL CF BEARINGS



On Sjogren Killers for casting wire, Multirol CF bearings with outer races grooved to required wire size have replaced hardened steel rollers. Sjogren maintained required accuracy at much higher casting speeds with minimum of grease instead of objectionable oil lubrication.



Warner & Swasey Uses MULTIROL® CF Bearings as

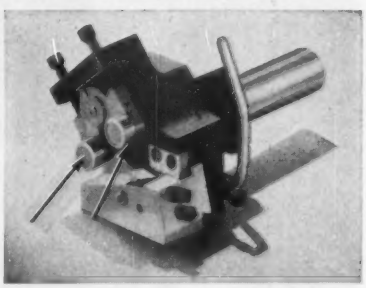
STEADY REST ROLLERS ON TURRET LATHES

The precision turning done on Warner & Swasey Turret Lathes depends to a great extent on providing adequate, accurate and free turning support for the work in process. The pressure of the cutting tool must be backed up on the end opposite the chuck so that depth of cut and concentricity remains constant.

This support is provided with tool holders using two Multirol Cam Follower bearings as steady rest or bar turning rollers. The precision quality of these rolls is very important to efficient operation. Free turning rolls of adequate capacity will assure work with a smooth finish and a high degree of accuracy.

Warner & Swasey have been using Multirol CF Series bearings in this application for over 15 years. They adopted the McGill bearing after finding its precision quality, resulting from close radial tolerances, ideal to help insure superior lathe performance.

The outer ring of Multirol CF Bearings operates on a full complement of small diameter rollers so the load is



evenly distributed over a greater bearing surface. The inner race and flange are made in a single piece with the stud, preventing any possibility of disassembly. Close tolerance grinding of all bearing surfaces insures greater accuracy throughout longer bearing life and, compared with plain bearings, lubrication is simplified and less critical. Both starting and rolling friction are reduced to a minimum. As a result, internal wear is diminished and power requirements of Multirol bearing equipped machines are cut appreciably.

BEARING SELECTION GUIDE
A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

McGILL® — Precision Bearings
McGILL MANUFACTURING COMPANY, INC.
300 N. Lafayette Street, Valparaiso, Indiana

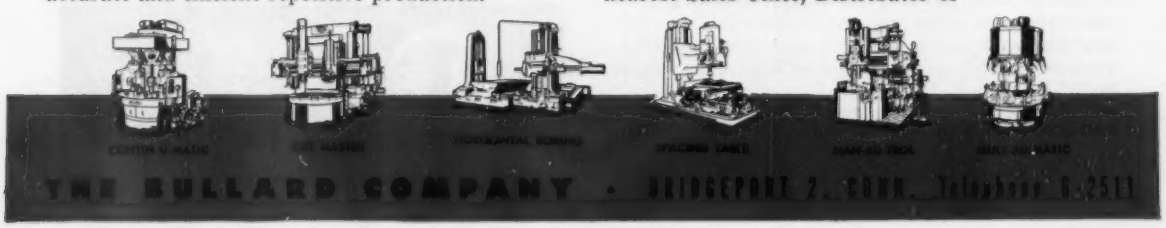
Seconds Count...

Time *is an Important Element in Profitable Manufacturing*

BULLARD MULT-AU-MATIC { Type "D" – 8"-12"-16" with 6 or 8 spindles / Type "D" – 16-23" and Type "K" – 6 spindles and 6 twin spindles – 8 spindles and 8 twin spindles }

Hour after hour, the Bullard Mult-Au-Matic Method is proving its production capabilities in plants the world over in many and diversified industries. Years of constant development and improvement have proved the Mult-Au-Matic Method as a key unit for accurate and efficient repetitive production.

Seventy-three years of machine tool "know how" and craftsmanship have been skillfully combined in the Bullard Mult-Au-Matic – a machine that reduces manufacturing time and makes seconds count for profits. We invite your inquiries – write to your nearest Sales Office, Distributor or



THE BULLARD COMPANY · BRIDGEPORT 2, CONN. Telephone 6-2511

Inspecting a special gage on a Taft-Peirce 24" x 36" Granite Surface Plate.

New Taft-Peirce GRANITE SURFACE PLATE Keeps Measurements On The Level

FOR PRECISION MEASUREMENTS that require the ultimate in smooth flat surfaces, Taft-Peirce now offers something new in surface plates. A Blue-White Granite Surface Plate. Made of a granite new to toolrooms, it's harder, more wear-resistant, easier to use and care for.

SURFACE ACCURACY is not subject to distortion. Plate is free from all residual stresses. Temperature changes or shock can't warp it.

SMOOTHER, its blue-white grain is extremely fine and even — yet natural pores assure free movement of tools and instruments.

PRACTICALLY INDESTRUCTIBLE, heavy pointed objects dropped on the surface barely powder point of impact. No humps or burrs are raised to impair accuracy. Unique grain direction running 45° to working surface of plate prevents cracking, chipping, or breaking.

RUST-PROOF, no oiling or covers necessary.

LOW POROSITY makes moisture absorption negligible. Tools or work left on this granite surface are not subject to rust.

NON-ABRASIVE, the extra-fine grain won't impregnate readily with dirt or grit particles to cause abrasion. Surface is easily wiped clean and free of foreign matter.

NON-MAGNETIC, it won't deflect instruments. Nor will its soft blue-white color glare or cause disturbing reflections.

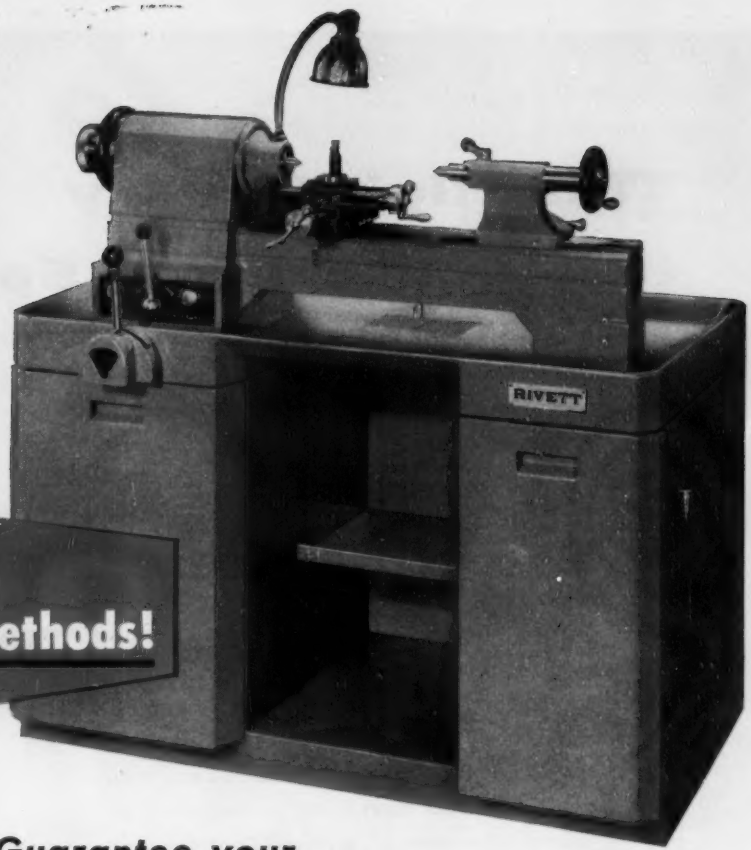
ACCURATELY GROUND AND LAPPED, backed by more than 75 years of experience in making precision products, Taft-Peirce Granite Surface Plates are the newest addition to a famous line of layout and inspection equipment.

Write for price list today.

For more information on surface plates and many other items, get your copy of the new Taft-Peirce Handbook.

T P *T-P means Top Precision*

THE TAFT-PEIRCE MANUFACTURING COMPANY • WOONSOCKET, RHODE ISLAND



Stop using "CUT and TRY" methods!

Guarantee your finish and size with a

RIVETT 918 Steelway Cabinet Lathe

FEATURES for more precision work

- **Instant selection of 90 to 3750 R.P.M. cutting speeds with convenient control and dial indication.**
- **Self-aligning slide rest automatically squares itself with line of centers.**
- **Double bevel steel ways, precision ground, provide positive centering action.**
- **Collets, with spacing of bearings doubled, have greater precision and gripping power.**
- **Lever chuck closer may be furnished with "one motion" control for collet, spindle drive and brake.**

Snug up to a Rivett 918 and with confidence turn, face or bore to your exacting tolerance—thrill with the knowledge that you are duplicating parts within "tenths".

The speed range and tool rigidity combined with the inherent precision of the 918 assures finish and size—perfect for second operations and toolroom work.

Use a lathe consistent in size with the work to be done—save on the initial expense and continue to save with each piece produced with less effort and without rejection.

Write for bulletin 918SL. Proof of what the 918 will do for you is shown in this 20 page book.

RIVETT LATHE & GRINDER, Inc.

Dept. AMR 1, Brighton 35, Boston, Massachusetts

For More Precision Work *RELY ON RIVETT LATHES AND GRINDERS*, The Master Craftsman's Master Tools

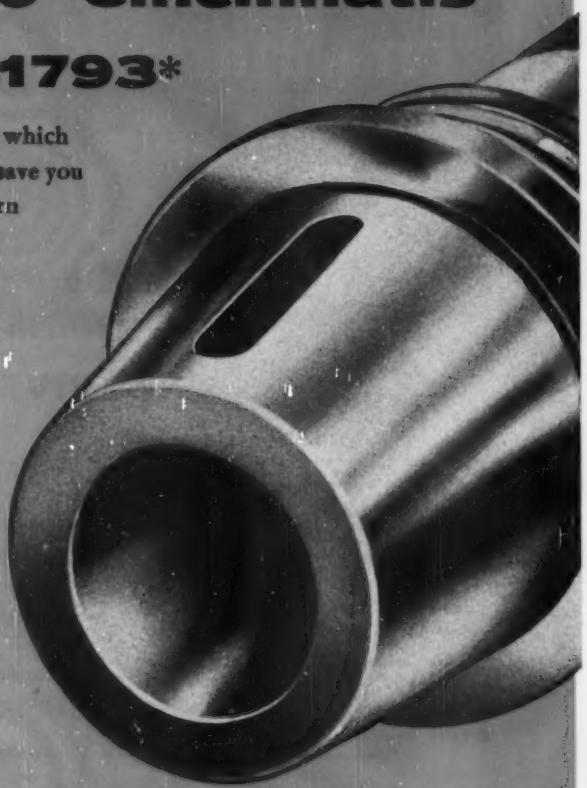
This High Quality Lathe Spindle

It's made from hardened alloy steel. It's extra long, with tapered key drive. Three antifriction roller bearings give it sturdy precision and rigidity. The hole is exceptionally large. It is as fine and durable as any lathe spindle, regardless of cost.

is Standard on 10" Cincinnatis costing only $1793*

Invest your lathe dollars wisely in a machine which can be busy 100% of the time. "Cincinnatis" save you hundreds of dollars in first cost . . . and return your investment faster. They're the only low-priced lathes with high-priced features.

*10" x 24" std. drive, FOB factory. Price subject to change without notice.



center on . . .

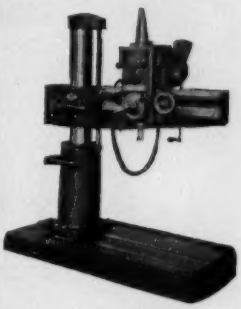
cincinnati lathes and drills

1. All-geared headstock
2. 12 spindle speeds in geometric progression
3. Direct-reading speed-shifting mechanism
4. Large spindle mounted in three antifriction bearings
5. Flame-hardened gears in headstock, quick change box and apron
6. Cabinet legs with built-in leveling jacks
7. Enclosed quick change box with lead-screw reverse
8. One shot lubrication of ways
9. Ground ways (flame hardened at extra cost)
10. Tray-Tops on headstock and tailstock
11. Double-walled apron with automatic lubrication
12. Fully enclosed electrical panel, built-in disconnect, transformer, motor and controls (all standard equipment)

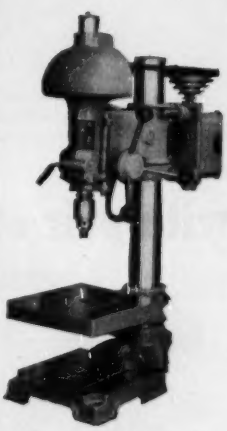
Cincinnati Tray-Tops: engine, toolroom, gap bed 10", 12½", 15", 18" swing.
Cincinnati Model LT: engine, gap bed 16", 18", 20", 24" swing.

For complete catalogs, prices and name of your local dealer, write on company letterhead to Cincinnati Lathe & Tool Co., 3241 Disney, Cincinnati 9, Ohio.

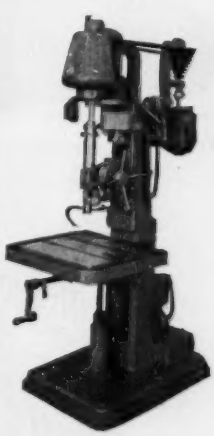
There is also a complete line of Cincinnati bench, floor and radial drilling machines



3' 7" Radial Drill



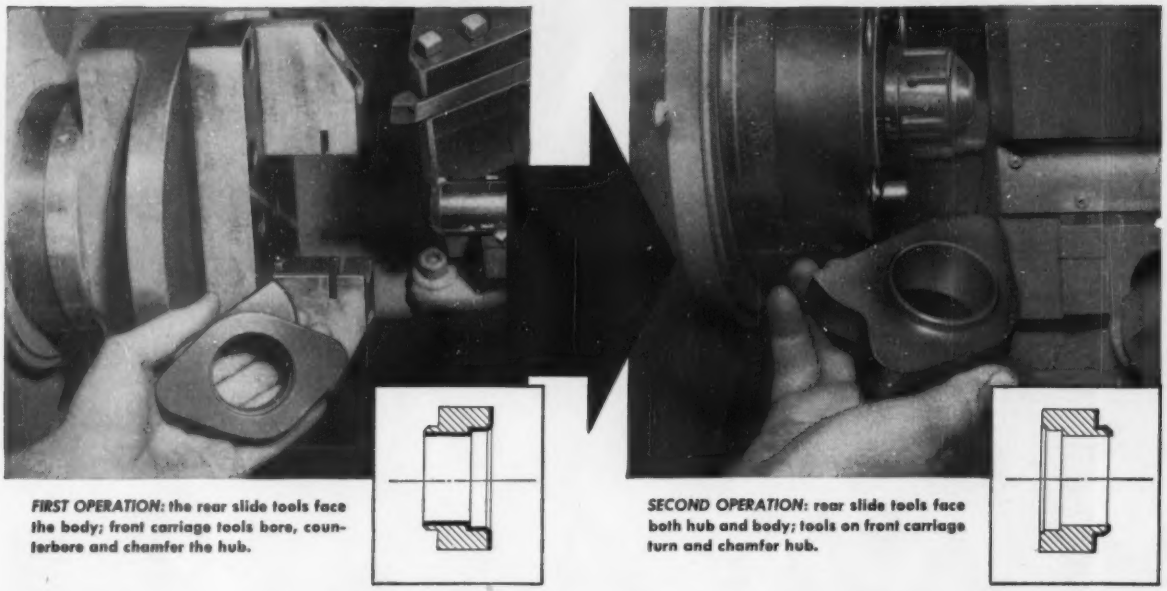
16" Royal Bench Drill



21" Sliding Head Box Column Floor Drill

Quick "pass-along" idea

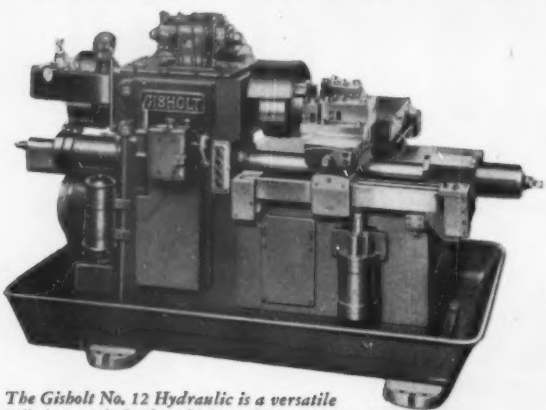
INCREASES PRODUCTION



FIRST OPERATION: the rear slide tools face the body; front carriage tools bore, counterbore and chamfer the hub.

SECOND OPERATION: rear slide tools face both hub and body; tools on front carriage turn and chamfer hub.

with pair of GISHOLT No. 12 Hydraulic Automatic Lathes



The Gisholt No. 12 Hydraulic is a versatile 12" Automatic Lathe which combines speed and accuracy with easy setup. Ideal for both chucking and between-centers work.

One operator with two standard machines now handles these cast iron manifold bodies in rapid succession—at a pace of 80-per-hour, at 80% efficiency.

This two-machine team pays off many ways: The operator loads and unloads one machine while the other is working—*automatically.* Investment is at a minimum because both machines *and* tooling are standard. Tool setups and replacements are simple.

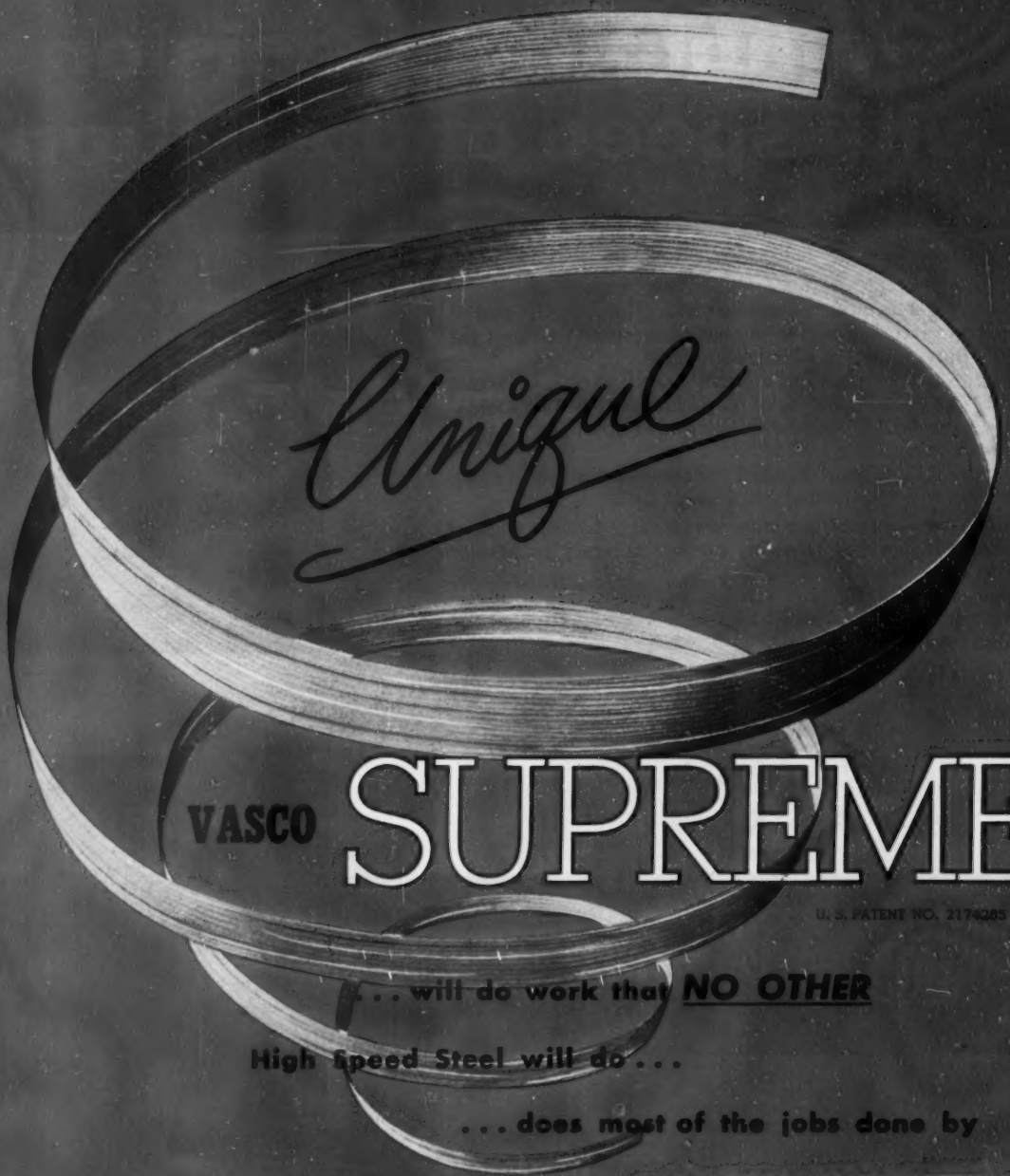
Whether you have continuous runs like this or even smaller job lot work—the speed and automatic operation of the Gisholt No. 12 Hydraulic may be your answer to lower costs. It's worth investigating.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



VASCO SUPREME

U. S. PATENT NO. 2174085

. . . will do work that NO OTHER High Speed Steel will do . . .

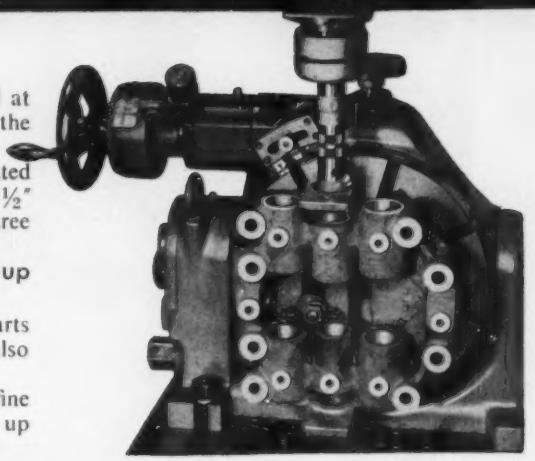
. . . does most of the jobs done by other High Speed Steels . . . 5 OR MORE TIMES BETTER!

There's only one Vasco SUPREME . . . unapproachable for high production performance; cuts harder materials and can be used at speeds 15 to 100% higher than other high speed steels. Hardened and ground flat tool bits now available from stock. *Do you have the remarkable facts on this High Speed Steel?*

Vanadium-Alloys
STEEL COMPANY
LATROBE, PA.

COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

Combining precision with speed of operation



The most complicated boring jobs are handled at maximum speed and within unexcelled precision limits on the SIP Jig Borer, using the tilting rotary table.

The camshaft bearing for a small Diesel engine illustrated on the right contained 26 holes ranging from 15/64" up to 1½" diameter, drilled, bored and counterbored according to three directions at right angles.

The entire machining of this part was completed **at one set-up** with a floor-to-floor time of 2 h. 40 min.

Flexibility and ease of operation permit large batches of parts of simple design and requiring extreme accuracy to be also bored economically.

Furthermore, the SIP Jig Borer allows for a variety of fine measurements. It leads to better quality of work, speeds up production and consistently

cuts the cost of precision boring

SIP

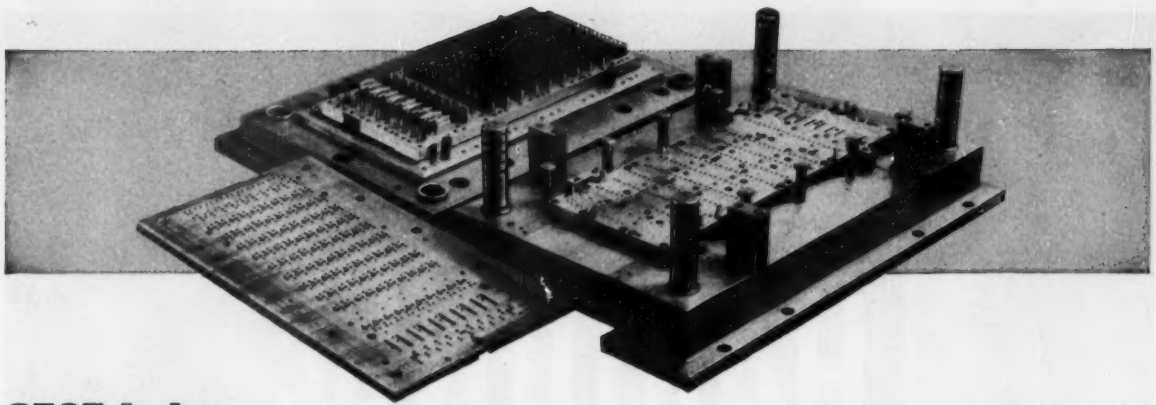
No. 3K Jig borer

with
micrometer screws
and
automatic pitch correctors

SPECIFICATION

Working range	18" × 14"
Table working surface	20½" × 15"
Free distance between uprights	23½"
From table to spindle end	max. 20½"
Spindle speeds (8)	75 to 2000 r.p.m.
Boring capacity, dia.	4"
Spindle quill travel	6"
Net weight	3,700 lbs

Guaranteed accuracy: .0002 in.



2565 holes accurately spaced, machined in a die, punch and stripper plate, for perforating 855 holes in a single sheet of hard cold rolled steel plate.

This performance was achieved in the works of a well-known tool maker of Detroit who owns eight SIP Jig Borers and says: "On these machines, we locate and bore all punch and retainer plates to within limits of .0002 in. Final checking can be disregarded as the Jig Borer constitutes itself a basic measuring instrument to which all shop measurements can be related".

SPECIFICATION

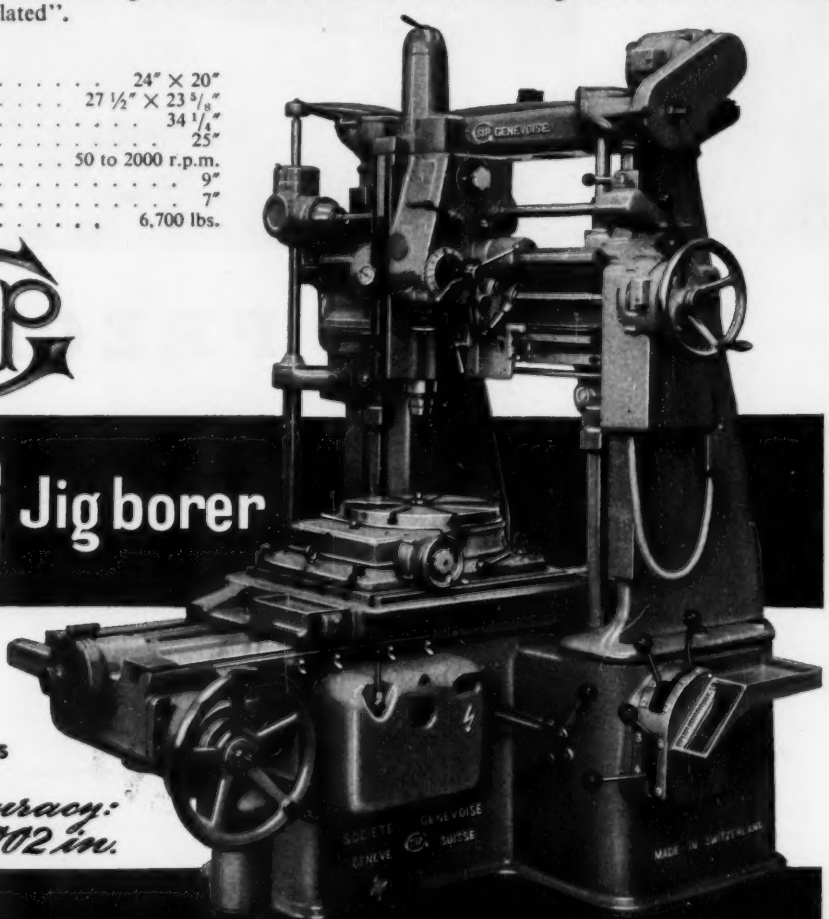
Working range	24″ × 20″
Table working surface	27 ½″ × 23 ⅝″
Free distance between uprights	34 ¼″
From table to spindle end	25″
Spindle speeds (20)	50 to 2000 r.p.m.
Boring capacity, dia	9″
Spindle quill travel	7″
Net weight	6,700 lbs.

SIP

No. 4G Jig borer

with micrometer screws and automatic pitch correctors

Guaranteed accuracy: .0002 in.



REPRESENTATIVE FOR U.S.A. AND CANADA:

AMERICAN SIP CORPORATION

HIGH PRECISION MACHINE TOOLS AND MEASURING EQUIPMENT

100 East 42nd Street NEW YORK 17, N.Y.

SIGN OF PRECISION

HARDINGE means precision in its truest sense . . . not a loosely used term applied to any machine.

Precision Construction — Hardinge machines are designed and built for profitable high speed, easy operation with sustained accuracy and low tooling cost.

Precision Operation — Operators of Hardinge machines can consistently produce precision parts — and operating simplicity permits unskilled workers to produce to close tolerances without expensive tooling.

Two Lines of Hardinge Precision Machine Tools for:

Precision in the Tool Room

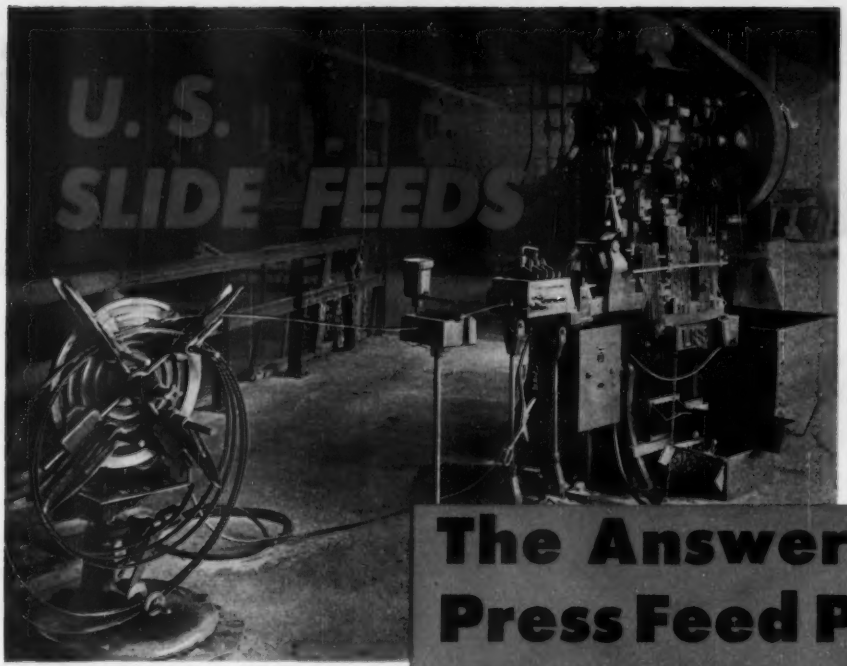
Designed for tool room needs, Hardinge High Speed Tool Room Machines: HLV Tool Room Lathe, TM or UM Milling Machines, and DV59 Lathe, provide extreme accuracy, high spindle speeds, and easy operation for precise, accurate results.

Precision in Production Departments

Cutting production costs to keep selling prices in line calls for these faster, more accurate, easier-to-operate Hardinge machines . . .
HC Chucking Machine, HCT Chucking Machine with Production Threading Head, and DSM 59 Second Operation Machine.

To specify Hardinge for the precision performance you want, write for complete descriptive bulletins.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.
"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"



Left: U. S. Slide Feed with Plain Straightener mounted on left-hand side of a conventional open-back press to feed from left to right. Also illustrated are a U. S. Combination Stock Oiler and Wiper, and Automatic Vertical Centralizing Type Stock Reel.

The Answer to Your Press Feed Problems

ACCURACY—U. S. Slide Feeds are recognized as the most accurate automatic feeds on the market for feeding material into punch presses. The slide block, which contains the blade to grip the material, reciprocates on hardened and ground slide rods between adjustable stops, insuring controlled accuracy of feed length.

VERSATILITY—They can be arranged for feeding left to right, right to left, back to front, front to back, etc. They can be used for feeding steel, brass, copper, aluminum, paper, cardboard, fibre, plastic, etc. in coils; or for butt feeding short lengths over .030" thick and of suitable stiffness.

AUTOMATIC OPERATION—The use of a U. S. Slide Feed converts the press into an automatic machine, resulting in reduced costs and increased production. All the operator has to do is thread and start new coils of material.

If press operations are included in your production program, U. S. Slide Feeds may be the answer. Ask for a copy of Bulletin 80-A, which contains complete specifications.

U.S. TOOL COMPANY, Inc.

AMPERE (East Orange) NEW JERSEY

Builders of U. S. Multi-Slides — U. S. Multi-Millers
U. S. Automatic Press Room Equipment — U. S. Die Sets and Accessories

Left: U. S. Slide Feed with U. S. Plain Straightener mounted for feeding right to left on press with crankshaft running from front to back instead of left to right, as on conventional presses. Also in photo is a U. S. Automatic Coil Cradle.

ARMSTRONG WRENCHES

Choose Your Wrenches as you do your friends--for life

Specify ARMSTRONG Wrenches for lifetime service, for finely balanced tools that feel right in the hand and make work easier, faster and less fatiguing. ARMSTRONG Wrenches generally are longer for size—give greater leverage. Accurately milled or broached openings give the proper clearance. They are safe wrenches because they are strong beyond need.

Drop forged and machined from high tensile carbon or special alloy tool steels, ARMSTRONG Wrenches are heat treated, tempered and tested to an exact balance of toughness, hardness and tensile strength. Each is beautiful in finish and line, is a quality tool to be proudly possessed by any mechanic—or certain to "give a lift" to any assembly line. Buy wrenches which carry the trade marks HI-TEN or ARMALOY. On carbon or alloy steel wrenches these trade marks are your guarantee of lifetime quality.

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ARMSTRONG BROS. TOOL CO. *"The Tool Holder People"*
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G. S. has developed and perfected the world's finest facilities for mass producing Small Gearing from 12 to 96 D. P. Make use of the special skills and experience we've gained through 35 years of specialization. Call us in at the drawing board stage for ideas, suggestions, and cost estimates. Join the long, growing list of critical buyers who come to "Small Gear Headquarters" for *all* of their requirements.

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See where and how we mass-manufacture Small Gearing to uniformly fine tolerances. This attractively printed 8-½ x 11" 6-page folder is punched for ring-binder use. You'll want to keep it handy for frequent reference. It contains 23 pictures of Small Gears, plant views, as well as Diametral and Circular Pitch Tables. Ask for your copy on company stationery, please!

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metal surface treatments that aid production, improve product quality, enhance appearance and durability...

BONDERITE

corrosion resistant paint base

This well-known product is used to prepare metal for fine baked paint finishes on thousands of products. Automobiles, trucks, refrigerators, domestic appliances of all kinds, control boxes, metal furniture, office partitions, transformers, and toys are a few of the types of products on which Bonderite is used.

Applied by either spray or immersion, Bonderite creates a nonmetallic phosphate coating over the entire surface. This coating is integral with the metal surface, forming an effective barrier against the penetration of moisture, and furnishing an excellent base for paint.

Bonderite produces dependable results of uniformly high quality, is easily controlled and economical in operation. It may be used to treat steel, aluminum, zinc, and cadmium.

Bonderite adds durability and appearance protection to painted metal by combating corrosion and anchoring the paint securely.

PARCO COMPOUND

rust resistant

This is the standard corrosion protection for iron and steel.

Iron and steel parts to be treated are immersed in Parco Compound solution, which creates a nonmetallic crystalline phosphate coating over all the surfaces of the metal. Complex shapes of all sizes from steel boat plates down to nuts, bolts and screws are treated with Parco Compound. Treatment is simple, controls are easily maintained, and cost is extremely low.

BONDERITE and BONDERLUBE

aids in cold forming of metals

These two Parker products are a big factor in accomplishing the present revolution in cold forming techniques. Nonmetallic Bonderite, used in tube mills for many years to hold lubricant, protect dies from excessive wear, and allow greater reductions—combines with the amazingly effective Bonderlubes to transform problem draws and extrusions into production routine.

The combination of Bonderite and Bonderlube is used extensively in the manufacture of shells and cartridge cases, shafts, gears and pins, making important savings in time, money, and material.

PARCO LUBRITE

wear resistant for friction surfaces

The nonmetallic phosphate coating created by this Parker Product reduces wear on friction parts and bearing surfaces. It is used on gears, pistons, piston rings, shafts, valves, pinions, cylinder linings, cams and other automotive and machine components.

Parts are treated by immersion in Parco Lubrite solution. The coating produced by this treatment prevents metal-to-metal contact, holds lubricants, reduces danger of galling and scratching, prolongs service life by protecting mating parts during the critical break-in period.

PARCOLACS

special finishes

Parcolacs are a group of special finishes to be used over Parco Compound. They include wax base finishes, stains, and rust preventive oils suitable for application by dip, spray, or centrifuge. There are types to meet slow or fast drying requirements, and other desired specifications. Parcolacs add to the appearance and performance qualities of the articles treated.

NEW! PARCOLAC BLACK AND PARCOLAC ALUMINUM

Two new Parcolac finishes can now be used over Parco Compound to enhance appearance and add greater corrosion resistance. Parcolac black and Parcolac aluminum are phenolic type finishes, applied by centrifuge, with excellent color and appearance and especially good resistance to corrosion. Excellent for parts that will be called on to withstand severe exposure and maintain good appearance.

ENDURION

corrosion resistant treatment in gray and olive drab

Two distinctive immersion treatments designed to react chemically with Parco Compound coatings to produce superior corrosion resistance. Easily controlled, simple to operate, Endurion produces uniform coatings which do not materially change the dimensions of the parts being treated. Very little additional equipment is required.

Endurion treatments are recommended where increased corrosion resistance is specified or where the chemically produced permanent colors are required.

PARCO CLEANERS

metal cleaners and conditioners

This line of scientifically formulated metal cleaners includes alkali, acid, and emulsion type cleaners. They not only remove grease and soil from the metal, but condition it for the next step in finishing. The line is complete, and includes one that can meet your production cleaning requirements.

**Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U. S. Pat. Off.*

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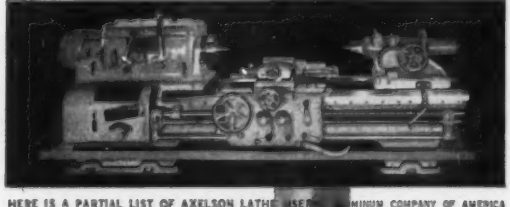
An Axelson lathe starts its long life under the watchful eyes of Axelson's own foundry experts. This means specifically, quality control begins at the beginning — in the lathe bed itself. Axelson's 40 years of lathe production is backed by even longer experience in foundry practice (1892). Every bed is *underground cast*, way side down, to insure closest possible grain structure and to achieve natural annealing and aging. Important, too, is the fact that all other cast parts, such as the carriage, the headstock [illegible] cover, the tailstock body and block, receive the same rigid quality control. By operating our own foundry, much higher than normal specifications can be indicated—*and met*. Thus, when we say at Axelson "A Lathe is Born," it is meant literally. At Axelson it is the offspring of experts —from the ground up.



HERE IS A PARTIAL LIST OF AXELSON LATHE USERS: [illegible]MINUM COMPANY OF AMERICA
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CHRYSLER CORPORATION • DEERE WATERLOO TRACTOR WORKS • DOUGLAS AIRCRAFT COMPANY
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GENERAL ELECTRIC COMPANY • HUGHES TOOL COMPANY • SOUTHERN PACIFIC RAILROAD
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AXELSON MANUFACTURES LATHES IN THE FOLLOWING MODELS AND SIZES: ENGINE LATHES, 16" H. D., 21" H. D., 25" H. D., 25" H. D., 32" H. D.; PRECISION TOOL ROOM LATHES, 16", 25"; GAP BED LATHES, 32"/106", 32"/125"; HOLLOW SPINDLE LATHES, 25" WITH 9-1/8" BORE, 25" AND 32" WITH 11" HOLE. 32" HOLLOW SPINDLE LATHE ALSO AVAILABLE IN GAP MODEL. ALL LATHES ARE FURNISHED IN VARIOUS LENGTHS AND WITH A WIDE RANGE OF TIME-SAVING ACCESSORIES.

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& SOFTENING TANKS • RESIDENTIAL FUEL OIL TANKS • AGITATORS • SMOKE STACKS • DUST
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A

LATHES: ENGINE • TOOL ROOM • HOLLOW SPINDLE • GAP BED • PETROLEUM PUMPING
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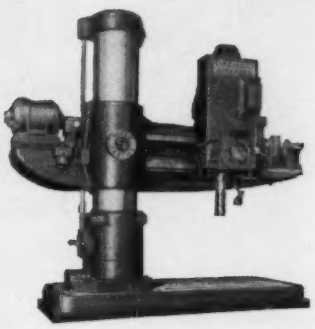
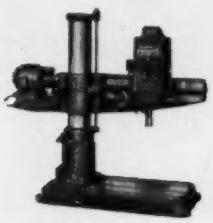
For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs. Our engineers will help you select the proper machine for your work. Write for bulletins on the machines that interest you.

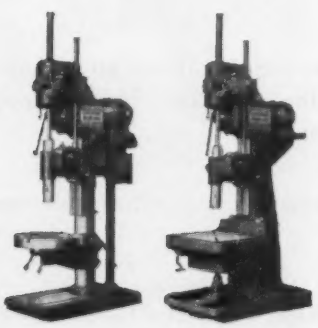
The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7′ to 12′ arm lengths and in 22″ and 26″ diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.



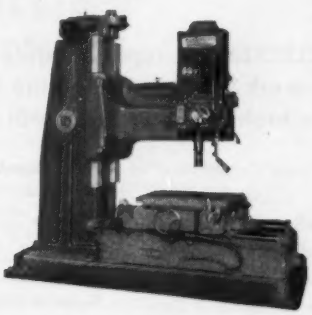
The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 13 different standard sizes, ranging from 3′ to 8′ arm lengths and 11″ to 19″ diameter columns. These machines are furnished with 7½ to 20 HP driving motors.



The 9″ Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21C, is built in either a 3′ or 4′ arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.



The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21″, 24″ and 28″ sizes. From 8 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.



The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.

The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21″, 24″ and 28″ sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

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There is a thoroughly qualified CLEEREMAN representative in your vicinity. Take advantage of his "know how." A study of your work may prove that the installation of CLEEREMAN equipment in your plant is the answer to your high cost and low profit problems.

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DRILLING MACHINES

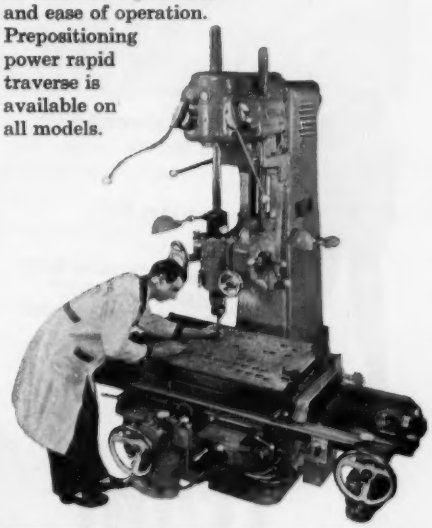
A battery of box column and round column Cleereman Drilling Machines on production work. One of many such installations producing at lower costs with higher production, less operator fatigue and no down time.

LAYOUT DRILLING MACHINE

A modern solution to an old problem. Built for those tool room and manufacturing jobs which do not require the ultra precision of Cleereman Jig Borers. The Cleereman Layout Machine is an economical machine capable of locating within .001″ per foot and drilling, boring, reaming, tapping, etc., with utmost operator ease at a fast rate of production.

JIG BORER

Unexcelled precision for ultra-fine tolerances on highest quality gage, tool, die, jig and fixture work and on "jigless" production. Combines stamina with precision and ease of operation. Prepositioning power rapid traverse is available on all models.



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Mounted Wheels		✓	✓	✓		✓
Cup Wheels	✓		✓			
"MX" Straight Wheels	✓	✓	✓		✓	✓
"MX" Mounted Wheels		✓		✓	✓	✓
"MX" Discs and Depressed Center Wheels	✓	✓	✓	✓	✓	
Coated Abrasive Discs		✓	✓	✓	✓	✓
Coated Abrasive Bands and Sleeves		✓		✓	✓	✓
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Coated Abrasive Belts with "Port-A-Belt" Grinding Attachment	✓		✓		✓	✓

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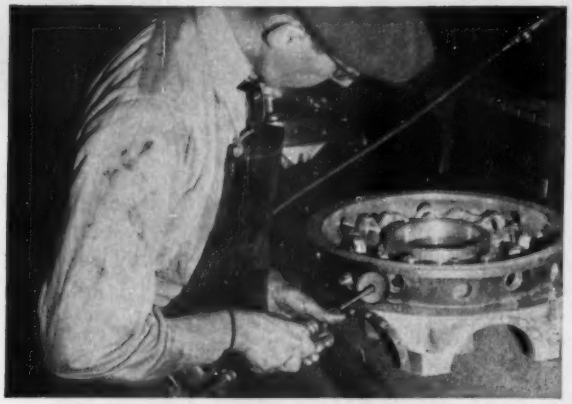
TRADE

PORTABLE GRINDING job



Deburring with slotted discs. You can choose the deburring method best for you from at least 7 abrasive products by CARBORUNDUM.

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CALL YOUR CARBORUNDUM DISTRIBUTOR TODAY. He offers experienced counsel, complete stocks, prompt delivery.

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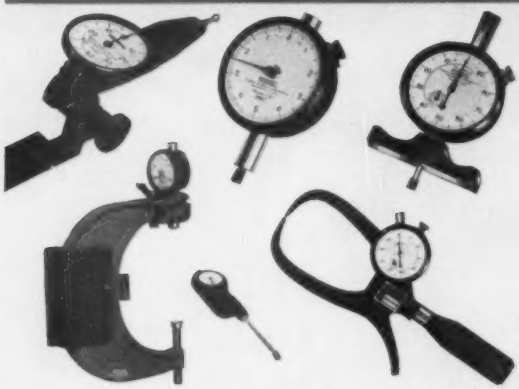

Indicators — over 80 different models, ranges, sizes, graduations, styles — for every accuracy, space, and visibility requirement. Indicating Gages of all types including snap, hole, depth, caliper, etc., and special.

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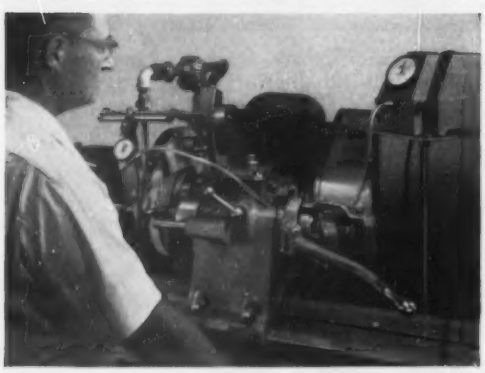
Federal Dimensionair: Greatest measuring range of any air gage — .003" with 2500 to 1 magnification. Most modern air gage. Available in various applications and combinations with Electrical and Electronic gages. *Send for new complete catalog.*

AIR GAGES



Grinding operations automatically and consistently size controlled — with exceptional accuracy. Also bare wire, insulated wire, glass tubing, steel rods, sheet, and similar continuous material is not only gaged in process but size-controlled by automatically adjusting the machine to compensate for variations out of tolerance.

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Call us in on the job when you start planning your gage requirements. We have helped many plants solve their gaging problems and we can help you too. Let us know your requirements. Federal Products Corporation, 1121 Eddy Street, Providence 1, Rhode Island.

has *Everything* in Gages for Dimensional Control

Multiple dimensions inspected simultaneously and quickly. (1) A single or individual light indicates at a glance if one or more dimensions are wrong. Or (2) separate lights identify incorrect dimensions and indicators show *how much*.

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Invaluable for selective assembly methods of production. Parts are measured and sorted into any number of dimensional categories with great accuracy and speed. 100% inspection without interfering with production schedules. Semi-automatic or hand fed.

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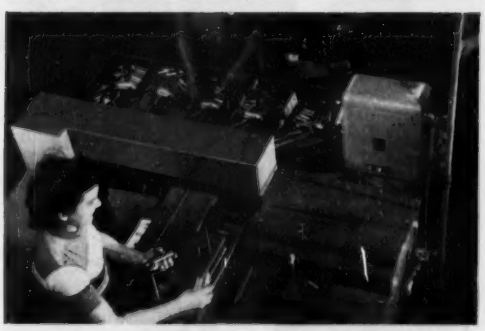

Federal can process engineer, design, and build complete sets of gages for any production job: Can often save money for you by modifying *stock* gages. Consult Federal before you process your next job. Save time and money and get better gages.

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Properly machine ground drills give better performance. OLIVER Drill Pointers, with each lip doing equal work, give balanced cuts—more accuracy—more perfect holes—more efficiency—longer drill life.

As Illustrated:

No. 21 Oliver Bench Drill Grinder. Hand operated for Drills No. 57 to ½".

No. 510. For Drills ¼" to 3". —2-3-4 flute.

OLIVER DIE MAKING MACHINES

Efficient, speedy and accurate — effecting great savings in time and costs. Skilled labor is not required for sawing, filing and lapping operations.

Available in 5 Models.

Bench Model S-1 (Illustrated) — Single Speed Die Maker for use on Tool Steel up to 1" Thick.

Heavy Duty Model (Illustrated) — 6 speeds, works in metal up to 3" thick, has variable strokes to 5" with hydraulics feed.

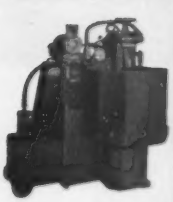
OLIVER ACE UNIVERSAL TOOL & CUTTER GRINDERS

Keep your most difficult cutters sharp with Oliver ACES. They excel on high speed and Tungsten-Carbide work. Direct reading for clearances reduces fatigue — eases operators' jobs.

The ACE excels for grinding face mills up to 15" —also, slab mills, • slitting saws, • all types cutters and reamers.

2 Models: Heavy Duty (Illustrated) and Standard.

OLIVER 20" TEMPLATE TOOL BIT GRINDER



Efficiently powered by a 3 h.p. motor, this OLIVER Machine grinds on the periphery of a 20" wheel. Capacity: tools up to 1½" wide x 1¾" high from 0 to 20° clegrance. The OLIVER is developed for production sharpening of single point Tungsten-Carbide and high speed tools—offers increased production, lower tool costs and savings in man-hours. Extremely fine finish assured.

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Backlash

EXTRACTS FROM CURRENT LETTERS TO THE EDITORS

Good Connections

I refer to the article, "Bell Wraps Solderless Connections for Joint Economy (*AM*—Aug 31 '53, p100).

Your article should be received with great interest by those concerned with making electrical joints and connections. I believe, however, that a part of the first paragraph, " . . . and despite the fact that that soldering remains the best method of making electrical connections in many applications, little has been done to improve the process," will be misunderstood by many readers. I believe the intent of the reference related to the particular applications and conditions which apply to compact telephone equipment where, because of closely spaced terminals, soldering was the only means by which connections could be made. Soldering operations are costly and unreliable because so much depends on human ability, cleanliness of parts, and environmental conditions.

Elimination of soldered connections in all phases of wire splicing and terminating has been the goal attempted by everyone. There are, however, some problems to be overcome, as in the electronics field where compactness of installation and smallness of wires does not permit sufficient space for a solderless connector. Bell Laboratories have perfected a method which apparently solves many problems. This method might be adopted for other applications, but proper terminal provisions must be made to make it workable.

I have, for over 20 years, seen the growth of solderless wiring methods and diminishing use of solder. We developed the first solderless terminals approved for electrical circuits in aircraft. We contributed to making practical solderless connections in naval vessels for most circuits, including all power, lighting intercommunication and fire-control, and telephone circuits.

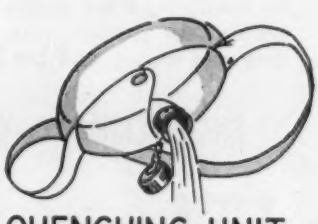
Most wiring in industrial plants, power plants, power transmission and distribution circuits, dwellings, and wherever electrical conductors are used, is spliced, taped, and terminated with solderless fittings. Specifications and standards for ships and aircraft make approved solderless connectors mandatory. The National Electrical Code recommends that approved solderless devices be used wherever possible.

A great deal of progressive effort has been made in the solderless wiring field. Such wiring has proved

GRINETICS

BY D G SMITH

CORE MAKER



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DIE SET

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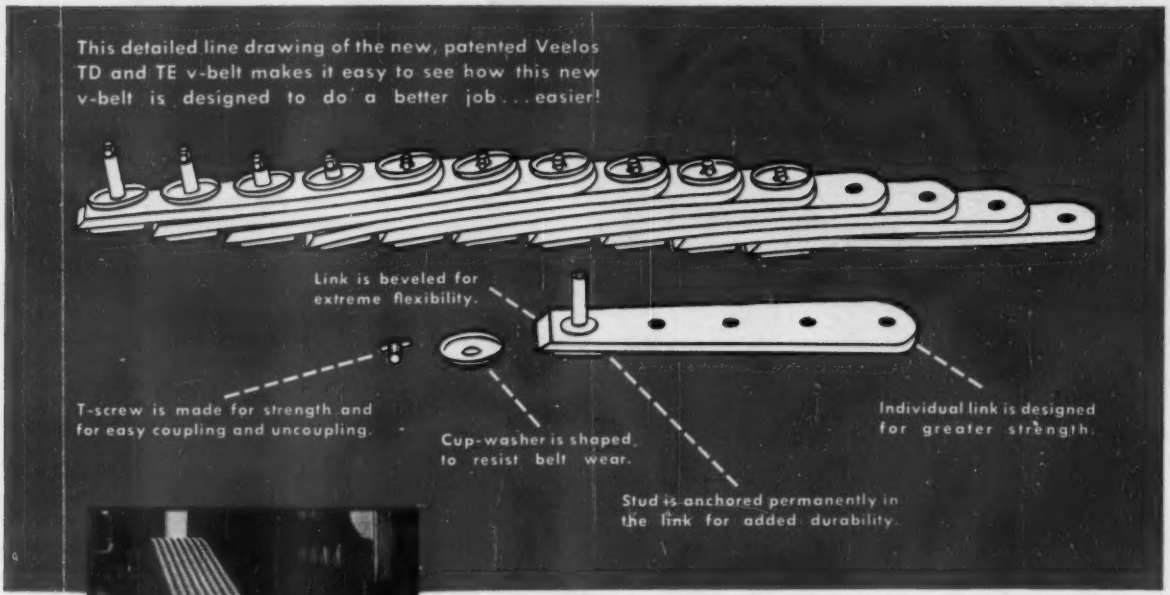
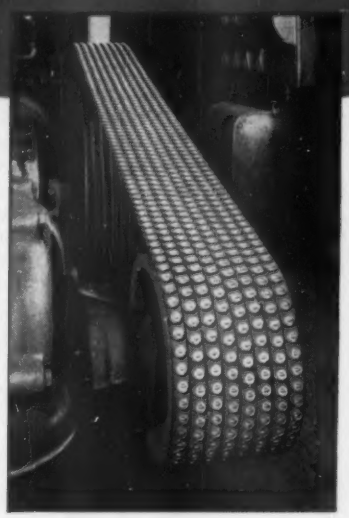

This detailed line drawing of the new, patented Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job . . . easier!
Link is beveled for extreme flexibility.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.
Individual link is designed for greater strength.



New VEELOS

TD and TE Adjustable V-belt

So easy to couple *it installs in minutes*

So strong and durable *it lasts for years*

The new Veelos TD and TE adjustable v-belt is the successful development of a specific v-belt designed for a specific service—D and E drives.

This new Veelos TD and TE v-belt has these basic advantages . . .

It simplifies installation. Links are quickly joined by easy-to-use cup-washers and T-screws to make up individual belts. It's the easiest v-belt to couple and uncouple ever developed. And you don't need to waste time removing outboard bearings.

It lasts longer—is more flexible. New high-tensile strength link combined with new stud, cup-washer, and T-screw gives added durability. New link construction provides maximum flexibility for cooler, wear-resistant running.

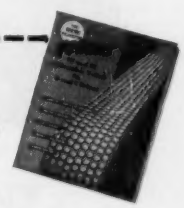
Get the complete story of this great new v-belt for D and E drives. Send coupon now for new 8-page illustrated catalog.

VEELOS
THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
601 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.



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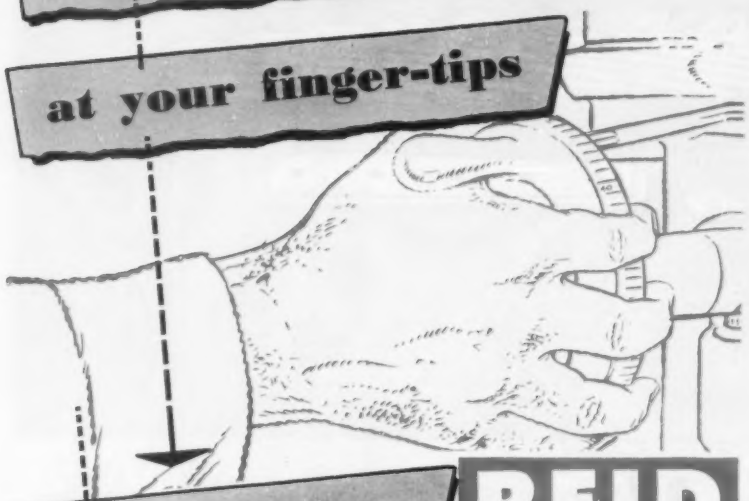
207

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

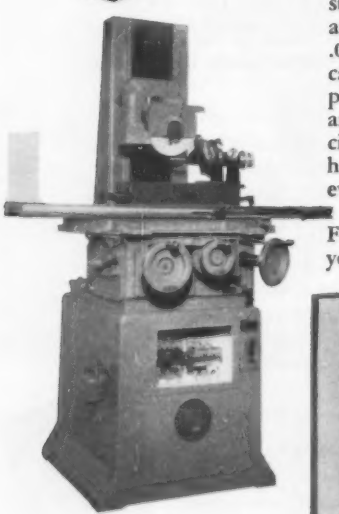
You have precision at your finger-tips when you use REID GRINDERS



Every move counts, with no tiresome reaching or bending, when you operate a Reid. All controls are right at finger-tip level . . . always under your complete control, reacting instantly, without backlash or wheel play.

Such dependable performance, the result of Reid's built-in accuracy, insures precision to meet the closest tolerances. When the shop order reads .0001", put the work on a Reid and you can be sure that the finished piece will pass inspection. Reid Surface Grinders are designed and precision-built by specialists who put the results of over a half-century of experience into their every detail.

Find out the full story on Reid Features for Better Grinding: request your copy of Bulletin 618-1.



Elevating hand wheel, graduated in .0005"
Optional: Vernier, graduated in .0001", for elevating hand wheel
Cross feed hand wheel, graduated in .001"
Power feed (Model 618V), automatic adjustable cross feed from .006" to .100" at each reverse of table.
Table speed, 12-35 feet per minute
Work capacity: 6" x 18"
Table size: 51" x 8"
Standard wheel: 7" x ½" x 1¼"

Reid Brothers Company, Inc.

BEVERLY, MASSACHUSETTS

more reliable, more foolproof, and less hazardous than soldering.

M D Bergen,
Director of Research,
Thomas & Betts Co,
Elizabeth, N J

We hope our readers did not misunderstand the statement in the article, because we did not mean to imply that pressure connections have not been good replacements for soldering in many applications. They have. The reason Bell Laboratories went to the wrapped connection was mainly a matter of space—and to use the least possible material in that space to make a good, permanent connection.

Another advantage for Bell, which is also an advantage of other solderless connections, is the reduced labor and time costs. Actually, wrapping is a form of pressure connection, but it uses no special connectors—just the wire. Solderless connections of all types will undoubtedly continue to replace soldering at an increasing pace — except for some few applications, like experimental work, special detailed work, and perhaps some others that will still be best served by the old solder joint. —Ed.

Brotherly Love

Maybe things are different in Philadelphia. I've always understood they had some funny ideas there—Main Line, and Scrapple, and stuff like that —but you can tell Mr. Salmons (*AM* —Nov 23 '53, p100) that we don't feel that way out here. I've never yet met a man who would turn down a raise in pay in favor of being given a feeling of importance. If a man wants to feel important out here, he does something important, and if it's important to his company he expects to get paid for it, too.

Joe Redding
Houston, Texas

I Like It

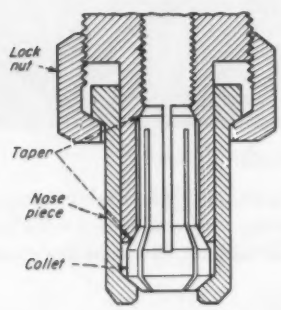
This subscriber was pleased to note the vast and varied response to the discussion on the Machinist-to-Toolmaker article (*AM* — Aug 17 '53, p129). While my primary objective in subscribing is to obtain a broader perspective and insight into the machinist trade, of which I am a member, it is good to hear about our highly regarded friends, the toolmakers.

KARL ENGELMANN
Glendale, Calif.

Whoa!

Employers have already gone so gaga over college degrees that you can hardly get a job selling underwear in a store without one. And now Fred Colvin comes along with the idea that shop foremen ought to have one, too (*AM*—Nov 23 '53, p98). I remember you, Fred, in the old days, and you didn't talk like that then. Don't tell me you have been corrupted by these newfangled ideas.

BOB NEWCOMB
New Haven, Ct



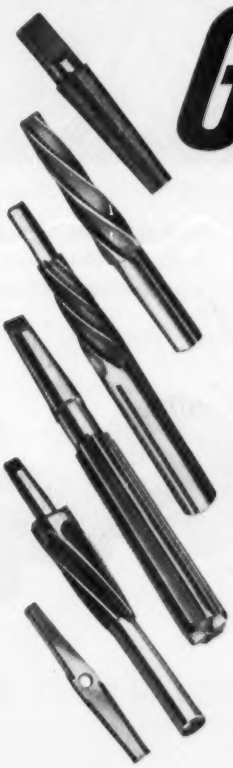
Omission

In our Special Report on Workholding Devices (AM—Oct 26 '53, p129) we inadvertently omitted any reference to a well-known type of holder which incorporates a double taper on the collet or mandrel sleeve to insure extremely high gripping power and accuracy. Collets and mandrel sleeves are open-slotted at both ends, and this, in conjunction with the double taper, insures equal expansion or contraction throughout the entire length to maintain alignment and grip the work.

The same double-taper principle is applied to air-operated speed chucks having a self-contained annular piston which operates against a series of levers pinned to a fulcrum sleeve. The multiplication of power thus obtained draws the collet back on the two tapers to provide extremely high gripping ability. — Ed

FOR SPECIAL REAMERS . . . REMEMBER

GORHAM



They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

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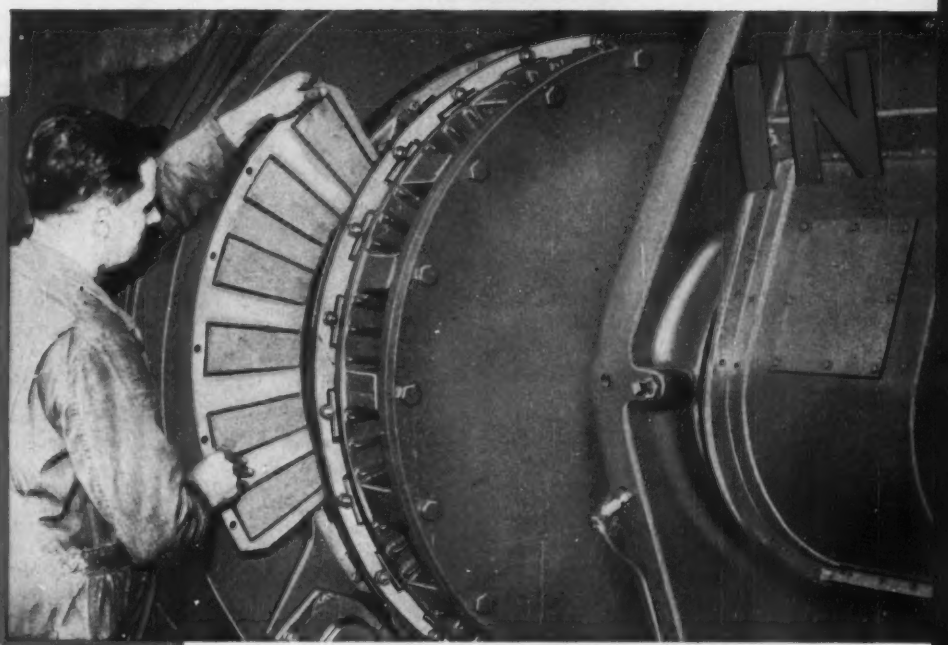
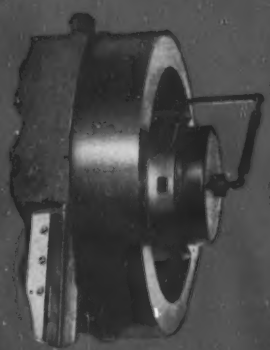
WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

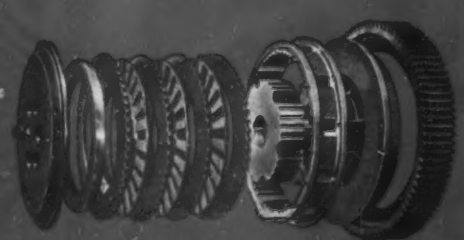
BLISS has the "right" design





Type "G" Friction Clutch

FOR INSTALLATION ON PRESS CRANKSHAFT. Provides fast action when working hot metal — helps avoid annealing. Operates perfectly under difficult conditions.

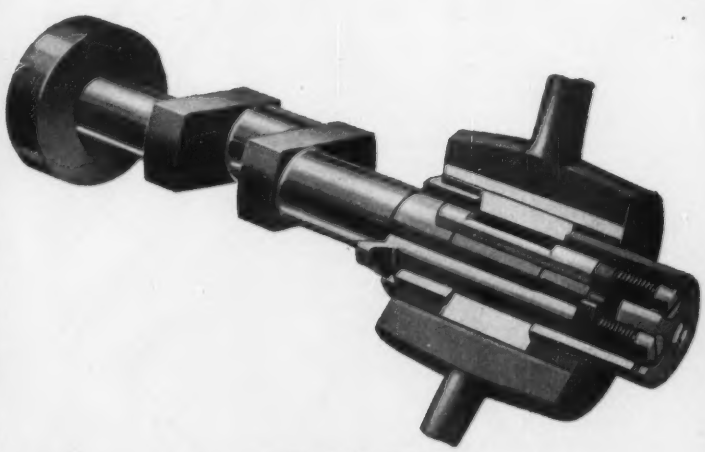


Type "P" Friction Clutch

FOR FORGING PRESSES AND HEAVY DUTY MACHINERY. A high torque multiple-disc unit that provides the extreme in clutch capacity. It requires no adjustments.

Type "K" Friction Clutch

FOR MEDIUM SIZE AND LARGER PRESSES. Highly compact brake and clutch unit. Cool-running, dependable and self-aligning. Friction plates are removable without disassembling clutch.



Rolling Key Clutch

FOR PRESSES UP TO 100 TONS CAPACITY. The all-purpose positive clutch, considered by thousands of users to be the finest positive clutch available. Equipped with "oilless" bearings.

PRESS CLUTCHES

for each type press

EXPERIENCE PROVES — no one clutch is right for *all* presses. Uninterrupted press output and operator safety depend on the action, reliability and easy maintenance of a clutch. That's why Bliss engineers, drawing upon a century of experience, have developed a variety of clutches to meet many different press needs.

Whether a press is large or small, flywheel or geared, open or closed, fast or slow, continuous or intermittent in operation, you can be sure every Bliss press has the "right" clutch to fit its particular operating requirements.

If you are experiencing clutch troubles — or if you are looking for improved clutch performance from new equipment — call for a Bliss engineer. He will quickly spot your trouble and make practical recommendations.

BLISS on your *clutch* is more than a name... *it's a guarantee*

E. W. BLISS COMPANY, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

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At Kaydon

ENGINEERING CORPORATION:

Maintenance Costs on

KING

VERTICAL BORING & TURNING MACHINES

Less than $25 a year

PER MACHINE!

Photo courtesy of American Machinist.

A 65¼" dia. Bearing Ring is shown being machined on a 72" KING Vertical Boring & Turning Machine at The Kaydon Engineering Corp. Accurate machining of these large diameter, thin sections is essential, since machining distortion cannot be removed by heat-treating.

The Kaydon Engineering Corporation, Muskegon, Michigan, manufactures a complete line of high precision ball and roller bearing assemblies, with rings of 4" bore to 120" OD. An essential part of Kaydon's distortion control methods for manufacturing these large diameter bearing rings having thin sections—often under ½" at the raceway—is *accurate* machining of the ring OD, face, and groove on KING® Vertical Boring & Turning Machines. (See photo above.)

Mr. Maurice Jensen, General Superintendent of the Kaydon Engineering Corporation, makes the following statement concerning his experience with KING machines: "Three 72" Kings have been in operation for about two years, 24 hours a day, five days or more per week, and our total maintenance cost for the three machines has been less than $25 a year per machine. One 72" King has been in operation for ten years with less than $50 yearly maintenance cost over this period."

Mr. Jensen further states, "It is possible to consistently produce pieces from these machines with a maximum eccentricity of .001. For high production runs and machining approximately .100 for a finish cut, we have successfully maintained a .005 tolerance, and we have found that the dial readings will repeat and give us a maximum variation of .003 to .005."

Here again is on-the-job evidence of typical KING performance . . . and why KING is industry's *first choice for accurate, economical work.* KING machines are made in 10 sizes, 30" to 144", in a variety of head combinations. Look into their advantages for *your* production.

American Steel Foundries

KING MACHINE TOOL DIVISION

1150 TENNESSEE AVENUE CINCINNATI 29, OHIO

SPOT NEWS of Metalworking

- **Fortiweld, a weldable steel with 80,000 psi tensile strength** that can withstand service stresses two to three times that of mild steels and has good physical properties at 450-500 C, has been developed in England.

- **Israel will buy $400,000 worth of machinery and tools** to equip six large vocational training centers: will be in the market for metalworking, woodworking, and engineering equipment.

Ford Motor Co is rumored to have signed an agreement with Innocenti works to set up an automobile plant in Naples, Italy, to manufacture 1100 cu cm cars similar to those made at Ford's Dagenham, England, plant. $14 million is said to have been deposited with the Bank of Italy as security, and a clause in the agreement covers importation of machine tools and raw materials.

- **Rubber or neoprene tires for greater bandsaw gripping power** are being used on new models of at least two major bandsaw manufacturers. Tire is molded around a perforated steel backbone, has flutings on inside circumference. Result: any cutting speed desired, no danger of tire coming off or exploding.

- **A million tons of titanium a year would be needed in time of war,** some authorities estimate. It took aluminum 70 years to achieve this goal, stainless steel several decades. And 1953 titanium output was only 2250 tons.

- **West German precision tool exports to the US and Britain are increasing.** Both countries bought more German tools in the first three quarters of 1953 than in all of 1952.

- **Kaiser Motors' Fiberglas Darrin sports car is now being shipped to dealers.** Turned out at Willys Motors Jackson, Mich, plant, the Darrin is priced at $3668 FOB, including such accessories as whitewalls, tachometer, windshield washer, etc.

- **"Special resistor long reach" spark plug is being used in the 235-hp Chrysler.** Designed for ¾-in. cylinder head opening, the new plug's double threaded surface area results in uniform cooling, wider heat range, longer plug life.

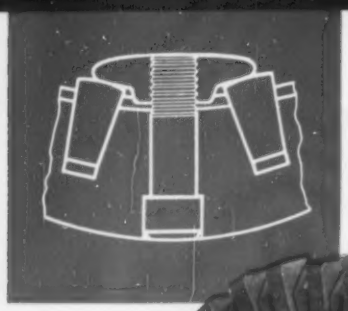
Internal grinding of titanium on a production basis, using a variety of wheels, coolants and wheel speeds, is reported at Bryant Chucking Grinder Co, which is producing a 6 mu-in. finish with 0.005-in. stock removal of 150-A titanium R_c30 in a ¾-in.-deep hole in 45 sec.

- **Ford, by selling more cars in the second half of '53** than in the first half, reversing the traditional industry pattern, has given UAW-CIO ammunition in its battle for a guaranteed annual auto industry wage. Auto manufacturers' arguments against the guaranteed wage are based on the fact that sales always drop off in fall and winter, and that production and layoffs must be geared accordingly.

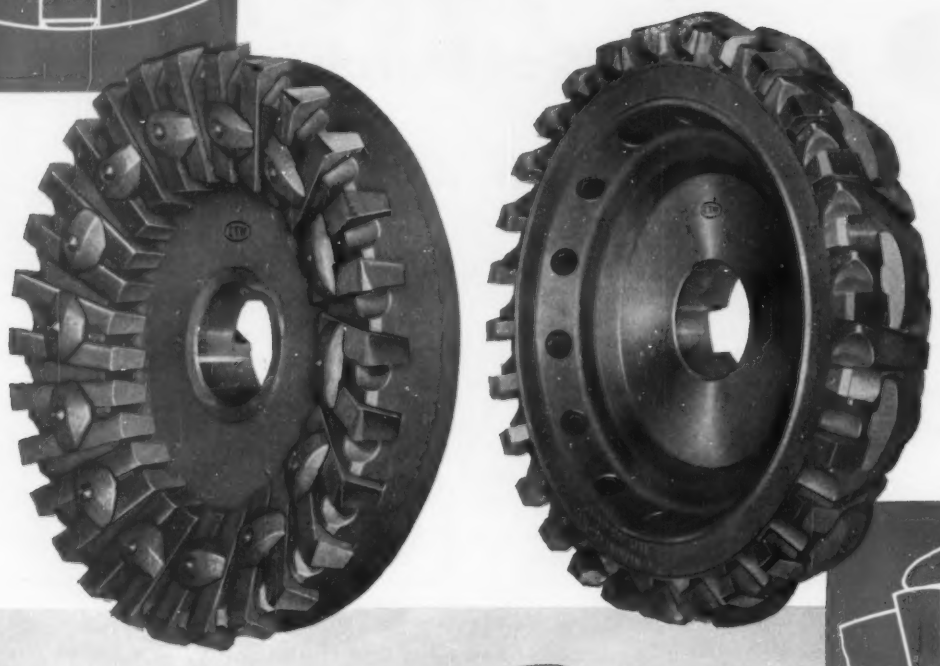
- **Chrysler expects to corner at least a third of Canada's auto market by 1955.** To do so, Chrysler of Canada has launched a $41-million expansion program, scheduling completion of body, engine and parts plants this year and early next year.

- **Largest single diesel locomotive order given one firm by a railroad** has been placed by Union Pacific with GM's Electro-Motive Division. Order calls for 205 locomotives. Price $35.7 million.

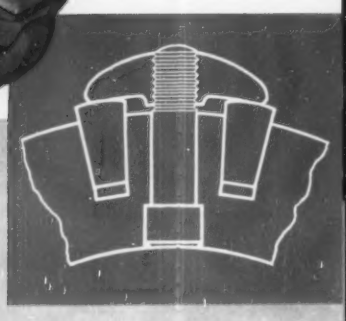
- **United Kingdom's 830,000 motor vehicle output in 1953 set an all-time record,** topping 1950's 785,000. The breakdown: 600,000 autos, 230,000 commercial vehicles.



Continental Inside Cone Face Mill with illustration showing how blades are locked in the rugged body.



Continental Outside Cone Face Mill with illustration showing how blades are locked.



Production Proved

...AND REALLY RUGGED

Continental Inserted Blade Face Mills offer the assurance that they're "just right" for your job. They've been proved in production in Ex-Cell-O's own plants and in hundreds of plants like yours.

Whether the job calls for inside or outside blades, you'll find that eight advantages of Continental Face Mills will bring lower tool costs on tough jobs:

1. *accurately machined* tapered blade slots.
2. *hardened bodies* to prevent slot mutilation.
3. *close blade spacing,* heavy sections between blades.
4. *positive-lock* blades.
5. *simplicity:* no screw threads in body; no loose wedges or pins.
6. *easy adjustment:* no special tools needed.
7. *longer blades* give more pieces and more grinds per blade.
8. *practically-indestructible* bodies.

Blades can be furnished in any material specified and cutters can be furnished with any specified drive or with combination drives for American Standard and Ingersoll machines.

Order through your Ex-Cell-O representative or from catalog. Write on your letterhead for Catalog 60681 if you don't have one.

Continental

TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

83-33

Washington

Randall Commission is putting finishing touches on its much awaited report to the President on foreign trade policy. The report will have no recommendations for wholesale relaxing of the US tariff system; the commission is far too divided for agreement on such a radical program. Report will be made probably next week, to get Congressional consideration as soon as possible.

Details on the report are still a closely guarded secret. But leaks from the commission's staff indicate it'll be a strange sort of report: its tone mildly sympathetic to protectionism, but with specific recommendations—in fine print—which could add up to a liberalized US foreign trade policy, if approved by Congress.

To mollify the commission's protectionist members, the report will probably avoid touchy particulars on tariffs, and cover the water front on all foreign trade matters—hitting peripheral issues like foreign aid, overseas investment, offshore procurement, commodity stabilization, currency stabilization, "Buy-American" legislation, and customs simplification.

On the tariff issue, prospect is that the Randall report will generally recommend (1) stabilizing tariff levels where they are, holding the door open for future reductions; (2) accepting the principle that direct compensation for industries hurt by foreign competition might better serve the national interest than tariffs; (3) changing the escape clause provisions of the Trade Agreements Act, tightening the definition of what constitutes "injury from imports."

Congressmen Simpson and Reed and perhaps other militant high-tariff Congressmen are expected to make formal dissents to specific commission recommendations, if not a full minority report.

• • •

President Eisenhower has put his weight behind a controversial ODM policy aimed to put more defense business in communities hurt by unemployment. The policy was announced almost three months ago, but procurement officials had been dragging their feet on it. The Pentagon had been quietly plugging for its abandonment, hoping the policy would be dropped as unworkable. To military officials, a preference plan for labor surplus area firms just adds an extra mass of red tape to an already-complicated procurement job.

The President's action quickly brought the White House into a clash with Senate Majority Leader Knowland, who aligned himself with southern Democrats in denouncing the preference scheme. They've hinted at legislative curbs to stop it. About half the communities classed as labor surplus areas are Southern, but Dixie Senators like Maybank and George consider the plan a boon to New England and a deterrent to new industrial development in the South. Maybank's pet taunt: the program makes government procurement agencies "illicit WPA's."

Actually, the existing preference program is only a skeleton of Truman policy made in 1952, which allowed defense contractors in labor surplus areas to match low bids made by other contractors, then take awards away from the low bidder.

Last summer, ODM Director Flemming abandoned this program under Senate pressure, and set up the new policy. This eliminated bid-matching, and provided for portions of a big defense purchase to be set aside for labor surplus area firms. Bulk of the purchase is awarded as usual to low bidders, the labor surplus area firms can get the "set-aside" by meeting the low bid.

Set-asides have been used before on military textile buying and to help small business. The new program retains some extra courtesies: labor surplus area firms get awards in case of tie bids; prime contractors are "encouraged" to award subcontracts to them. It also introduces a new aid: when you build a new defense plant in a distressed area, you get fast tax writeoff on a bigger percentage of your investment than if built elsewhere.

• • •

ODM calls the new squabble a "tempest in a teapot." Officials say the proportion of defense contracting placed in labor surplus areas under the preference program has been infinitesimal—about $50 million out of some $145 billion post-Korea defense spending.

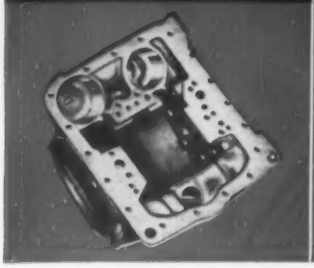
Even more, they argue, the 17 major and 22 smaller labor surplus areas represent only about 4% of US industrial facilities, and that defense-contract awards to these communities are naturally limited by capacity to produce defense goods.

In the main, the labor surplus areas classified by the Labor Dept are depressed coal towns like Scranton, Wilkes-Barre and Hazelton, or mill towns like Providence, Durham and Lowell.

• • •

In the front line of defense against an extended economic downturn is the administration's program for boosting weekly jobless benefits and extending these payments to millions more workers. This is considered at least of equal importance to Eisenhower's drive for easing Taft-Hartley restrictions on labor.

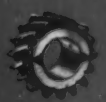
TRANSMISSION CASE (CAST IRON) THREE TYPE I, ONE TYPE III SURFACES



PUMP GEARS (CAST IRON; STEEL) SIDE SURFACES, TYPE IV

TRANSMISSION COVER AND GOVERNOR BODY (BOTH ALUMINUM) TYPE III SURFACES

PINION GEARS (HARDENED STEEL) THREE TYPE II, TWO TYPE IV SURFACES



FOR PRECISION FINISHING OF FUNCTIONAL SURFACES

PowerFlite transmission parts are *Microhoned*

Chrysler engineers, with years of proficiency in production-processing of precision parts, have specified the Microhoning process as the method for obtaining

✶DIMENSIONAL ACCURACY ✶GEOMETRIC PRECISION ✶CONTROLLED SURFACE FINISH

required for the efficient functioning of the new PowerFlite transmission.

FOUR TYPES OF SURFACES IN THE *PowerFlite* ARE MICROHONED:

Type I—Cylindrical surfaces through which a piston or valve moves.

These surfaces must be round, straight and accurately sized, with a controlled surface finish—in order to minimize wear and eliminate oil leakage. The Microhoned finish assures non-flaking surfaces between the stationary and moving parts.

Type II—Cylindrical surfaces in rotating parts.

Microhoning maintains concentricity of pitch diameter of teeth and the bore of gears, permitting teeth to mesh with minimum noise and wear. The bore must have precise geometry, size, and functional finish to retain a lubricating film at high speed.

Type III—Flat surfaces that are bolted together without a gasket.

They must be flat enough so that they will not distort when pulled together, and must have a surface finish that will mate to form a tight, effective seal.

Type IV—Flat surfaces that move in contact with stationary surfaces.

These must be smooth and flat in order to minimize friction and wear, and maintain a "running seal", thus eliminating leakage.

For more information on the Microhoning process write to:
Field Engineering B7
Micromatic Hone Corporation
8100 Schoolcraft Avenue
Detroit 38, Michigan

PRECISION PRODUCTION THROUGH MICROHONING
MICRO MATIC

VALVE BODY (ALUMINUM) TWO TYPE III, ONE TYPE I SURFACES

KICK-DOWN GEARS (STEEL) TYPE IV SURFACES

TRANSFER PLATE AND REGULATOR BODY (BOTH STEEL) TYPE III SURFACES

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REPRESENTATIVES:

Overgard Machine Tool Company, 234 Commonwealth Bldg., Denver 2, Colorado • Allied Northwest Machine Tool Corp., 103 S. W. Front Ave., Portland 4, Oregon

REPRESENTATIVES IN ALL PRINCIPAL COUNTRIES

Detroit

Four years ago, Nash built a small, two-passenger experimental car called the "n.x.i." A survey was made to determine how many people would pay "$1000 or less" for such a car.

Apparently the public liked the idea well enough that the car, now called the "NKI," can be seen scooting around Detroit these days, and will be introduced in March. But it's a far cry from the original "n.x.i."

The public didn't like the original 18-hp engine, so Nash has installed a 42-hp engine. The original 80-in. wheelbase wasn't enough said the public. It'll be 85-in.

The original two-bucket seats were too confining. Now the NKI has two straight seats.

The NKI will likely be the most economical to operate of all production makes. But it won't cost "$1000 or less." It'll be more because the improvements the public asked for cost more money.

It will be priced under $1500, however, and at least 10,000 NKI's will be built this year for Nash by two British auto firms.

• • •

Unless some unforeseen obstacle knocks production scheduling awry, this should be the biggest January on record in terms of passenger car output. Ward's Reports estimates that nearly 518,000 cars will be built—about 20,000 more than were built in January, 1950, biggest previous January total.

• • •

GM's sales volume figures are so rarely broken down by division, it seems worthwhile to record that Cadillac new car, used car and service volume was $850 million in 1953—16% over 1952.

Tooling costs for 1954 Cadillacs, unconfirmed, ran to about $32 million. The company has 1954 production of 117,000 cars — importantly above 1950's record 110,000.

And Cadillac has 93,000 orders on hand—each bolstered by a $100-or-more deposit. Experience indicates that about 75% will materialize into actual deliveries.

• • •

Nowhere are reasons for independents' mergers more apparent than in production totals.

In 1953 autodom's Big Three accounted for 91% of total passenger car output: in '52 86%.

Independents' share thus dropped from 14 to 9% in one year — the reason why one merger has been completed, and why talk of other mergers and/or combines is still lively. At this writing, Nash and Hudson officials are still closeted, talking merger.

Big Three production shaped up this way in 1953: GM 3,279,440 cars and trucks; Ford produced 1,863,669; Chrysler 1,351,850.

• • •

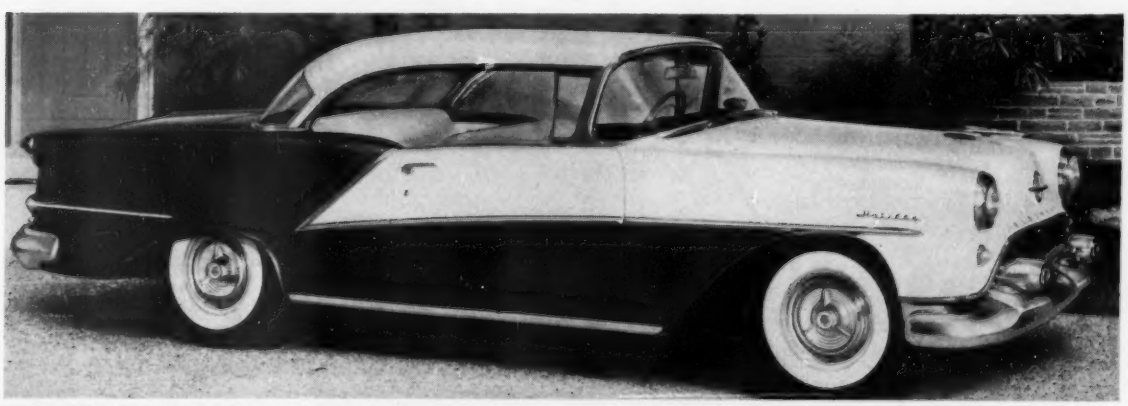
Chevrolet appears to be going after police fleet sales now in Ford's hands, is readying a police pursuit car to compete with the Ford interceptor, which this year is using a 256-cu-in. Mercury engine. The Chevvy model reportedly will use a 261-cu.-in. engine employing a Chevvy truck engine block.

• • •

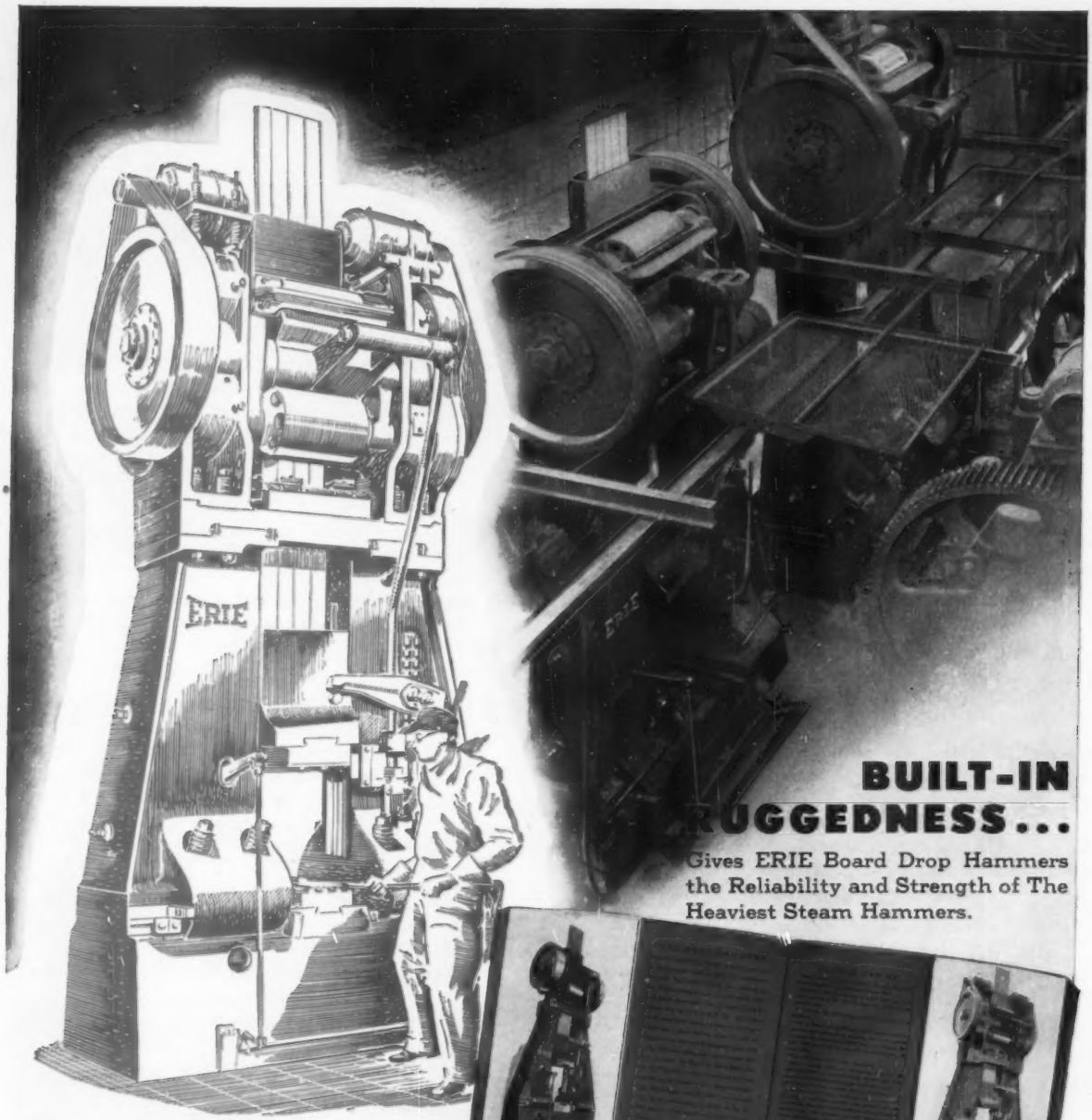
Traditionally, lion's share of auto output is concentrated in the first half of the year, when demand normally is highest.

But Ford reversed this trend in 1953 and produced 55% of its total in the second half.

Tremendous second-half output posed sales problems that Ford licked by pre-war "hard selling."



THE NEW OLDSMOBILE (model shown is the Olds 98 DeLuxe Holiday Coupe) is indicative of the shape of GM cars to come, at least for the next three or four years. — 3-in. lower, 2-in. longer, with wrap-around windows, full-sweep doors, cowl ventilator. Horsepower in the Super-88 and 98 has been upped from 165 to 185, on the 88 to 170. To achieve the lower chassis, the frame has been redesigned, Hydra-Matic transmission is rotated 22° counterclockwise for clearance, rear suspension is altered. Olds claims the 1954 Rocket engine uses 10% less gas.



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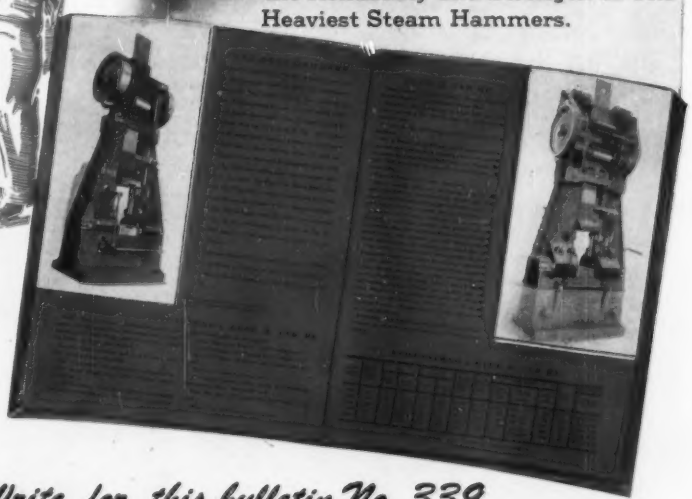
Rated from 400 to 10,000 lbs. . .
All parts subject to impact —
upper works, frames, anvil are steel.



ERIE

Write for this bulletin No. 339

ERIE FOUNDRY COMPANY · *Erie, Pa., U. S. A.*

ERIE BUILDS *Dependable* HAMMERS

Machine Tools

The press building industry is going great guns. Its production is at a high point and its sales have been very good.

It is repeating its experience following World War II. It did not do as well relatively as machine tool builders during the war. But once the war was ended, good times set in.

Now that the post-Korean defense program is over the hump and emphasis again is on civilian business, press builders are doing better comparatively than machine tool builders.

• • •

Press business has come from a variety of sources. The automobile industry is high on the list.

Ford, for one, is expanding its stamping facilities and is reported to have on order a large number of presses.

Backlogs have piled up so much that some builders are losing orders to others who can promise better deliveries.

It is not possible to say how long good business will last in the press industry, but 1954 appears safe.

• • •

Machine tool buying is expected soon for a new shell producing plant to be operated by National Pressure Cooker at Eau Claire, Wis. Planning engineers' recommendations are said to be in the hands of the Ordnance Corps for approval.

Boeing's tooling program for a new big plane is reported about ready to break. Air Force is in the process of approving the appropriation. Much of the buying is likely to be for the Wichita plant.

McDonnell Aircraft in St Louis is doubling the size of its plant. It has revamped its plans, has cancelled some machines already ordered and placed orders for others.

• • •

Machine tool builders have agreed to cancel altogether $92.3 million of uncompleted pool orders, the third annual report of the Congressional Committee on Defense Production discloses.

Builders were commended "for their voluntary cooperation" in cancelling (1) all unassigned tools not in actual production and (2) all incompleted units covered by firm orders.

Decision also was made on what machines actually in production but unassigned could be cancelled at minimum cost.

• • •

Builders arranged to store any completed units that GSA must accept until 30 days prior to contract expiration. Thus the builder might sell them and relieve the government of handling and storage charges.

GSA negotiated 115 machine tool pool-order contracts with 113 builders covering 94,225 units valued at $1.4 billion.

The Committee's most recent figures show that 55 contracts were still in force with 10,516 units still to be completed.

• • •

Of that number, builders had firm orders for 8943 units. That left 1573 units valued at $37 million for which no orders had been received.

GSA had taken over 584 tools from previously completed contracts, with a value of $6 million.

That brought the government's total contingent liability to $43 million.

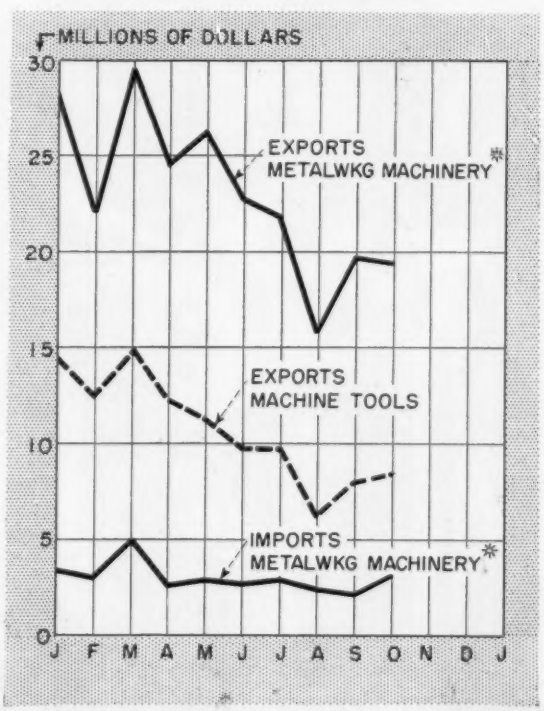
• • •

James C Kelley has been named deputy director of the Metalworking Equipment Division of the Commerce Department's Business and Defense Services Administration.

He formerly was chief of the Navy's machine tool section. In 1940-1942 he was associated with the Monarch Machine Tool Co. He is well known throughout the machine tool industry.

BF

METALWORKING MACHINERY IMPORTS and EXPORTS 1953



* includes machine tools

NEW CARBOLOY
CEMENTED CARBIDE

Increases production up to 30% on heavy-duty steel-cutting jobs

New Grade 370 Carboloy cemented carbide cuts more cubic inches of steel per minute – with longer tool life – than any existing carbide. The first of the new Series 300 cemented carbides, Grade 370 was specially developed for taking heavier cuts in steel at higher speeds than ever before practical.

BUILT-IN TIP RIGIDITY

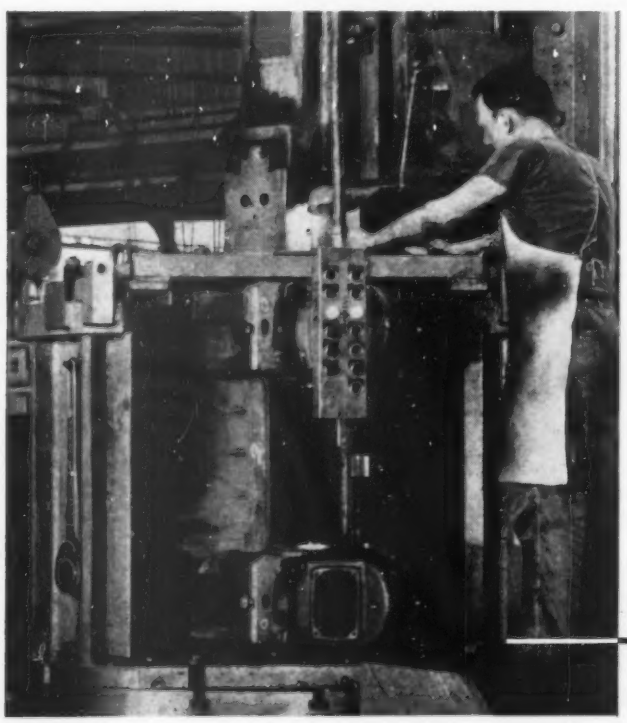
Heavy-duty, high-speed machining builds up great pressures and high temperatures which cause other tools to fail because their cutting edges deform. Grade 370 is made from start to finish by a new, carefully controlled manufacturing process which gives it a built-in structural rigidity to resist this deformation – even at temperatures of around 1800° F.

PROVED PERFORMANCE

Grade 370 has already been proved, both in Carboloy laboratories, and on tough on-the-job customer applications such as rolls, gun barrels, locomotive wheels and other heavy-duty operations. It successfully withstands higher temperatures and pressures of heavy cuts at higher speeds, and lasts longer – longer than any existing carbide. *Production goes up as much as 30%.*

AVAILABLE NOW

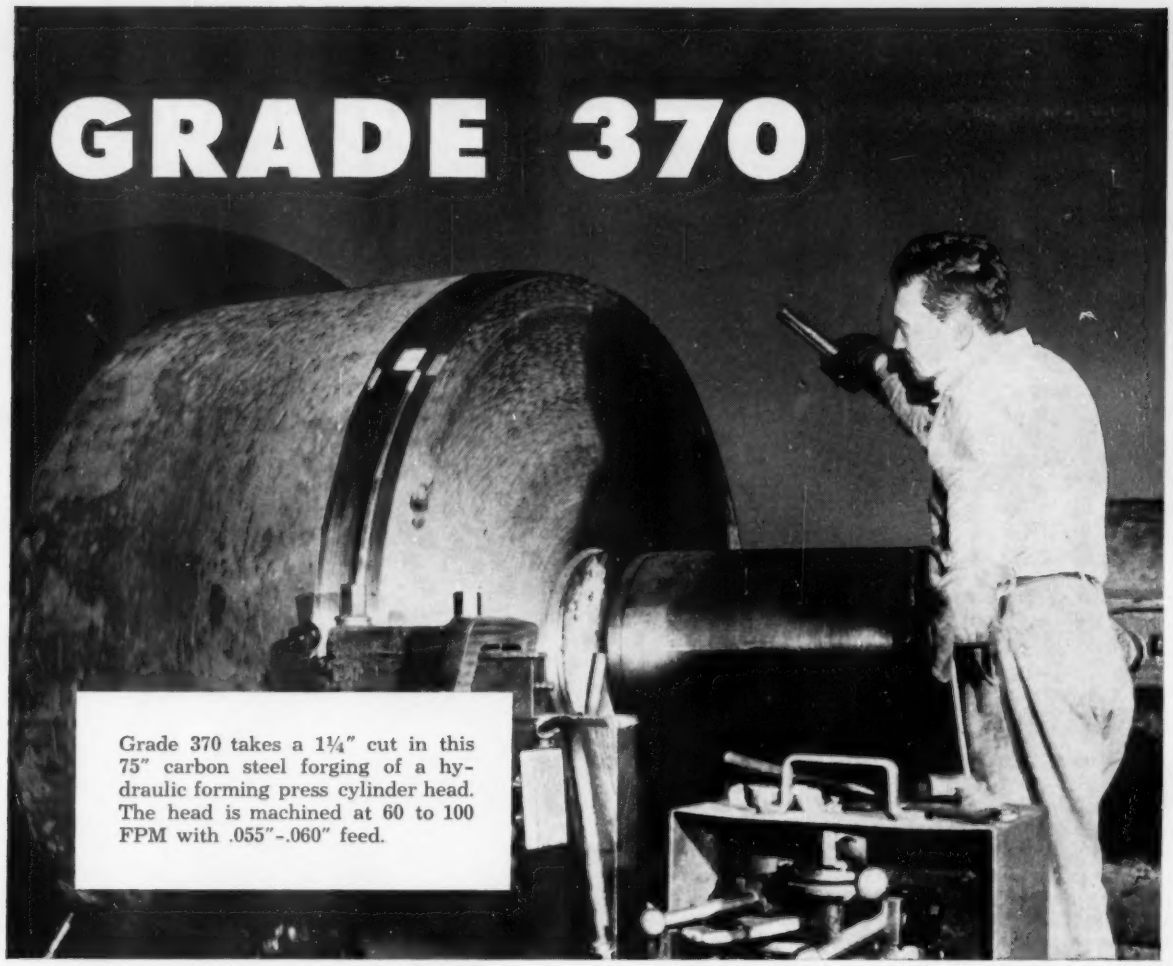
Grade 370 is available immediately in a number of sizes and shapes. Send coupon today for additional information and for free technical literature. The Carboloy Engineering Appraisal Service will work with you on specific applications.



Close-up of cylinder head forging. Grade 370 cuts large chips and withstands the tremendous pressure and temperature without deforming. With Grade 370, both machine downtime and tool cost per cubic inch of steel removed were substantially reduced.

Vertical mill taking ¼" to ¾" cut in an alloy steel casting for a traction motor frame. Grade 370 machined 70 FPM with .060" feed . . . and resulted in a reduction of tool costs of approximately 10 to 1 over other carbides.

GRADE 370



Grade 370 takes a 1¼" cut in this 75" carbon steel forging of a hydraulic forming press cylinder head. The head is machined at 60 to 100 FPM with .055"-.060" feed.

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DEPARTMENT OF GENERAL ELECTRIC COMPANY

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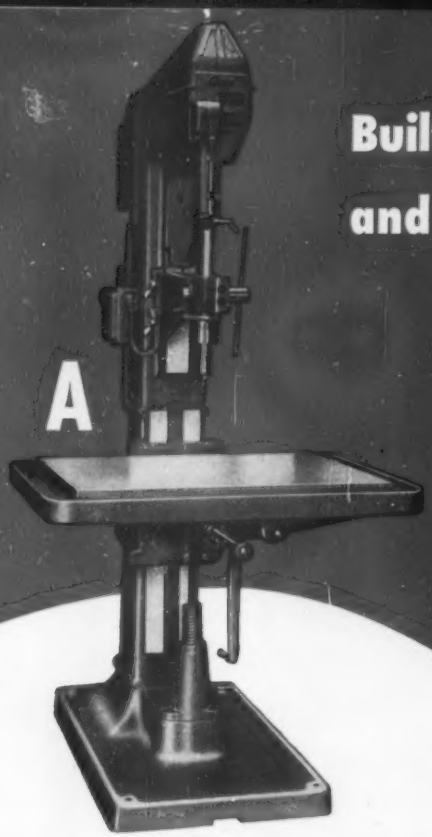
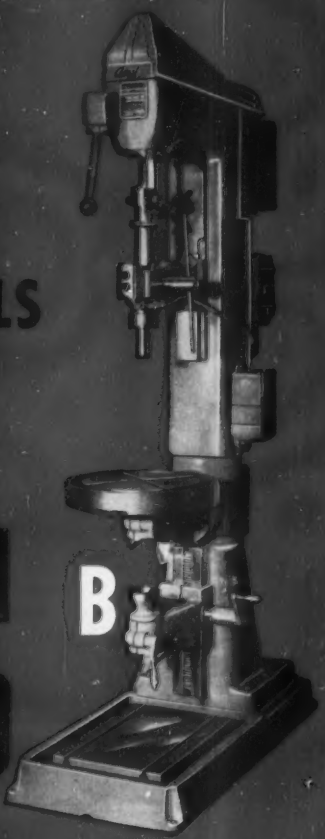
Built for ACCURACY . . . SPEED . . .
and Long Lasting PERFORMANCE . . .

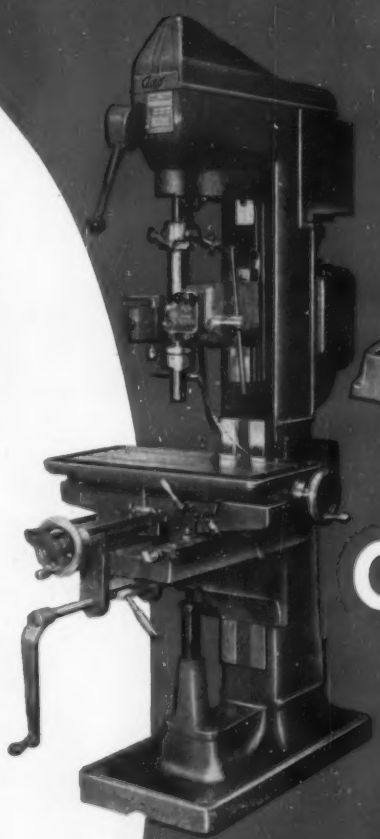


Avey BMA-6

TOOL ROOM DRILLS

Built in No. 2 and No. 3 Sizes





A. LARGE TABLE MACHINE—The large heavily ribbed table, 34" x 25" plus ample chip trough, allows room for large dies or fixtures, plus additional space for tooling, etc. Each six splined precision ground spindle and drive sleeve is supported by five rows of precision ball bearings which give the precision needed. The machine has six speeds which are easily obtained through a shifter lever, positioned in front of the machine. The machine also has three speed ranges, low, medium or high which are easily changeable for future jobs requiring higher or lower speeds.

All BMA-6 Machines may be obtained in hand feed, Avey-matic automatic feed, and power feed with or without reversing motor and control for tapping.

No. 2 BMA-6 Machines may be obtained with #2 or #3 Morse Taper, optional and #3 BMA-6 Machines may be obtained with #3 or #4 Morse Taper optional.

B. ROUND TABLE TOOL ROOM MACHINE—The drilling unit is mounted on a round table, lower column, and base. The base is planed and regularly furnished with two tee slots. Above the planed base is one auxiliary bracket adjustable vertically which may position a vee center, a cup center or an additional table. Beneath the spindle is positioned the regular round table, which is 18" in diameter and contains tee slots and coolant trough. This table may be tilted either way up to 90° or can be moved to the side or rear of the machine to allow work to be done on the lower table or planed base.

C. COMPOUND TABLE MACHINE—This machine is ideal for tool rooms and die shops and may be used for layout purposes which greatly assists jig bore work. The compound table is rigidly supported by a ball bearing mounted elevating screw and has vertical adjustment on the dovetail of the lower column. The working surface of the table is 25" x 12" plus ample chip and coolant trough. In and out travel of the table is 5" either way and cross travel is 7½" either way. Both tables are moved by Alloy Steel lead screws with automatic wear take up on screws.

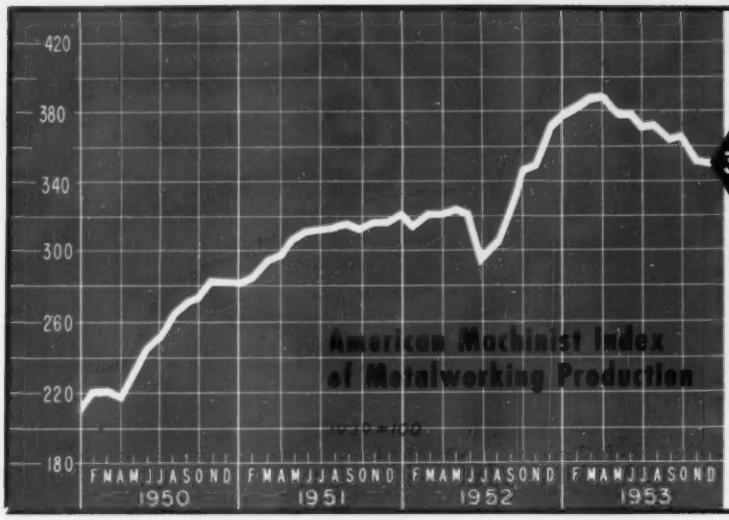
Both tables are scaled in ½" with dial reading on lead screws graduated to read .001. (one turn equals .250). Both tables have felt wipers on ways and table surface is regularly furnished with two longitudinal tee slots.

Consult the yellow pages in your phone book—under Machine Tools—for our nearest representative, or write direct to our factory.

Avey

THE AVEY DRILLING MACHINE CO. Cincinnati 1, Ohio

Gaging Metalworking



PRODUCTION INDEX

BASED ON MANHOURS WORKED IN THE FIVE COMPONENTS

	DEC '53(*)	NOV '53(p)	OCT '53(r)	NOV '52
Tot. Index..	**350**	**352**	**360**	**353**
Machinery	**312**	**319**	**320**	
Electrical Machinery	**405**	**415**	**405**	
Autos	**267**	**282**	**270**	
Other Transportation	**605**	**606**	**573**	
Other Metalworking	**351**	**355**	**353**	

(*) Estimated (p) preliminary (r) revised

Metalworking has started the year off well. But there is no use pretending that the gradual but steady slippage in operations has ended.

Most companies will be satisfied if they can hold production at the fourth quarter level. Many say that they can do this, but others privately doubt whether they can.

• • •

Certain bearish factors are in evidence. Overtime is being erased more and more. Work which long has been subcontracted is being pulled back into prime contractors' plants. Skilled metal workers, even tool and die makers, are in surplus in a few spots for the first time in years.

Many buyers who had been counted upon for juicy orders have shown a vexing tendency to sit on their hands. They are believed to be waiting to see what Congress will do, and meanwhile are confining purchases to day-to-day needs.

• • •

The steel people are not pleased. New orders released by customers since January 1 have been less than expected. Heavy buying of sheet and strip by the automotive industry has not materialized. Steel salesmen are scrambling for tonnage and are back in competition with warehousemen for any decent-sized order.

Result in that January is turning out to be a relatively poor month for steel bookings and first quarter operations may well be 25% under last year's.

• • •

Out of 15 automobile parts makers in the Cleveland area, seven expect to run through this quarter at the present rate, which matches that in the fourth quarter, five will add workers, and three will lay people off before long.

Parts makers with General Motors and Ford contracts are the happy ones. That goes for people making castings and stampings too.

Suppliers of independent car makers hope for seasonal orders that will bring them back up to top production by mid-February.

Some household appliance companies plan to turn out more goods this quarter than last. Reason: Filling pipelines for spring deliveries to dealers.

Machinery production still is very good. But it is easing too as output continues to far outstrip sales and as deliveries shorten.

• • •

West Coast metalworking operations will be very good this quarter. They will be down somewhat in the Los Angeles area compared with a year ago, but up from the fourth quarter level.

Airframe makers, with one exception, feel that things will be as prosperous as they were at last year's peak. One source puts the backlog at $6 billion, with high production and employment anticipated this year.

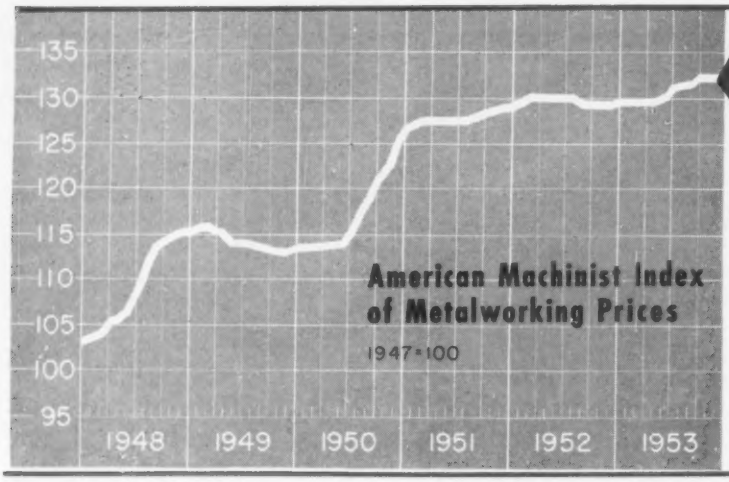
• • •

Labor market in southern California has eased, but some manufacturers still say that they have trouble getting skilled help.

Metalworking in the San Francisco district will stay at about the fourth quarter volume, or 10% below the 1953 high.

Makers of metal goods are optimistic, on the whole, and believe that lessened business merely indicates a healthy return to sounder conditions.

Gaging Business



PRICE INDEX

	DEC '53(*)	NOV '53(p)	OCT '53(r)	NOV '52
Total Index	**132.6**	**132.6**	**132.5**	**129.5**
Metalworking Machinery	**141.8**	**141.7**	**137.8**	
Other Machinery exc. Electrical	**137.3**	**137.1**	**132.2**	
Electrical Machinery	**131.7**	**131.7**	**124.4**	
Fabricated Metal Products	**128.9**	**128.9**	**128.0**	

(*) Estimated (p) preliminary (r) revised

Metalworking output may pick up a little in the first few months of 1954, with auto production leading the way.

The auto makers turned out 6.1 million cars and 1.2 million trucks and buses in 1953 for the second best year in their history.

Only 1950 (6.6 million cars, 1.5 trucks and buses) was bigger, except that 1953 truck and bus output was only sixth best in history.

The auto people are looking forward to greatest January passenger car production of all time and this could give all metalworking a boost.

Steel production, too, is on the upgrade. Ingot and castings output should shortly hit close to 2-million tons per week.

But steel mills will be operating at only 85% of total new capacity. And steel scrap prices are falling again—to $31 per ton—lowest in four years.

• • •

Unemployment rose sharply in December. Total jobless at 1953's end numbered 1.85 million, 400,000 more than in November, and about 425,000 more than in December 1952.

December employment shrank 1.2 million from the November total to 60.8 million. This was 1.1 million below the December 1952 figure.

• • •

Installment credit tightened up in November, when consumers added only $100 million to their total debt, smallest increase in 19 months.

Credit outstanding at November's end for autos, appliances and other goods was $21.6 billion, $8.6 billion higher than a year ago.

• • •

Manufacturers' sales dropped off from October to November but were still higher than they were in November 1952.

November dollar volume was $24.2 billion, 1½% under October sales but 2½% over November '52.

November backlogs stood at $60.6 billion — almost $15 billion under a year ago. Inventories dropped between October and November but were still $2.5 billion over 1952.

WEEKLY BUSINESS INDICATORS

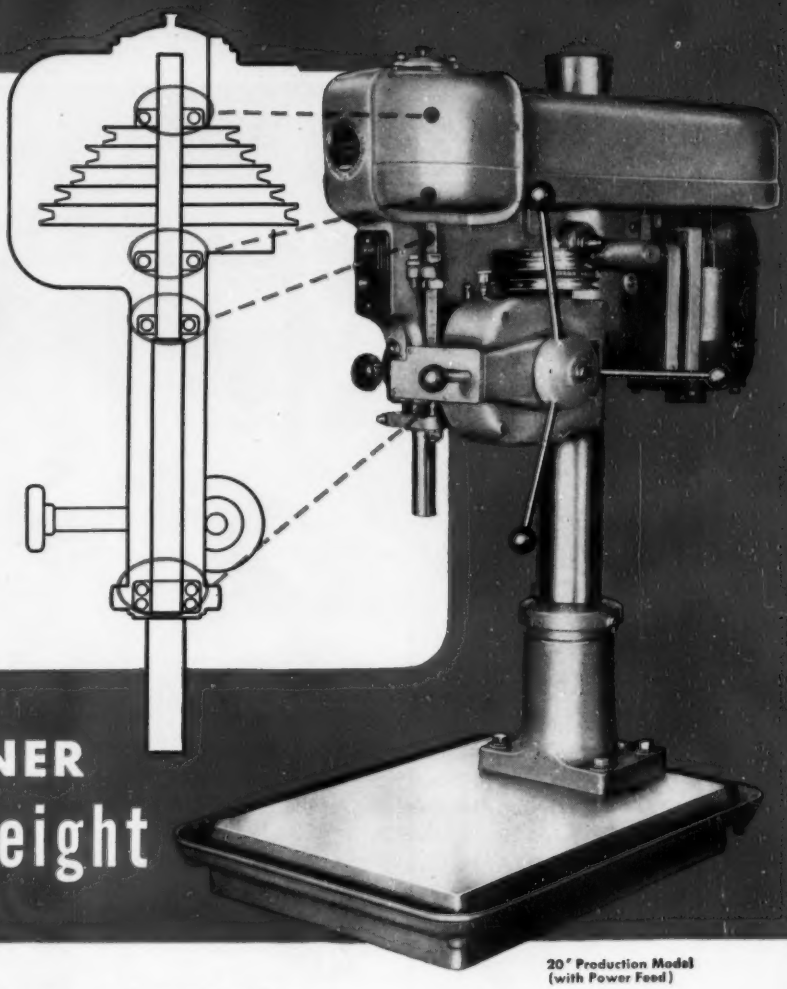
	Latest Week	Preceding Week	Year Ago
Business Week Index of Activity (1923-25 = 100)*	243.6	243.6	251.0
Steel ingot production (thousand tons)	1,788	1,706	2,213
Electric power output (million Kilowatt hours)	8,200	8,174	7,713
Production of automobiles and trucks	91,135	92,247	106,102
Engineering construction awards (*Eng. News-Record*, millions)	$225.9	$153.2	$323.7

MONTHLY BUSINESS INDICATORS

	Latest Month	Preceding Month	Year Ago
Refrigerators sales (thousands of units)	140	180	279
Vacuum cleaners sales (thousands of units)	216	249	254
Washers sales (thousands of units)	238	311	293
Household electric ranges sales (thousands of units)	73	73	75
Radio production (thousands of units)	1,061	1,052	795
Television production (thousands of units)	561	680	780
Gear sales index (1935-1939 = 100)	144.9	211.1	131.7
Foundry equipment new orders index (shipments, 1937-1939 = 100)	445.8	202.9	258.1

* Seasonally adjusted

Better HEAD-work makes this



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20″ Production Model (with Power Feed)

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In every way this Walker-Turner 20″ Drill Press is built to turn in an outstanding performance for you. The HEAD construction is a first-class example.

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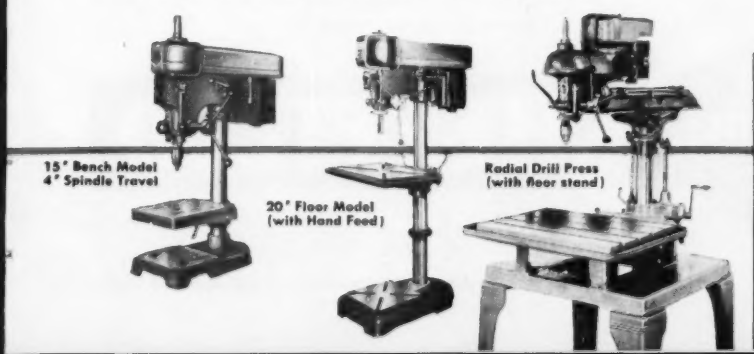
When you take a good look at the Walker-Turner *Light-Heavyweight* Drill Press you'll agree that it represents a real opportunity to cut your investment in equipment. You'll see it has what it takes to handle most any job.

Your Walker-Turner factory-trained distributor will show you all the fine features—just phone him. Or mail coupon.

SOLD THROUGH *FACTORY-TRAINED* INDUSTRIAL DISTRIBUTORS



15″ Bench Model 4″ Spindle Travel

20″ Floor Model (with Hand Feed)

Radial Drill Press (with floor stand)

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• DIVISION •

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PLAINFIELD, N. J.

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Wood and Metal Cutting Band Saws • Tilting Arbor Saws
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Walker-Turner Division, Kearney & Trecker Corp.
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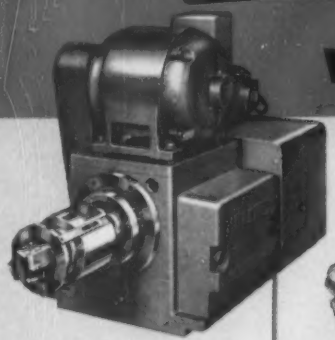
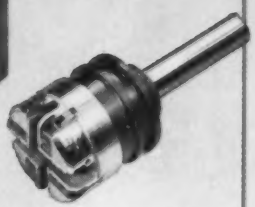
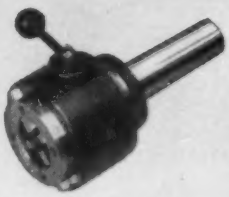
Reduce THREAD COSTS and *Increase* THREAD QUALITY with MURCHEY TOOLS



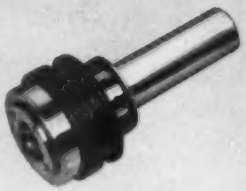
Precision-Pak with die heads and collapsible taps automatically taps holes up to 4" dia., cuts external threads up to 3½" dia.—also bores and reams. Lead accuracy assured by precision lead screw.



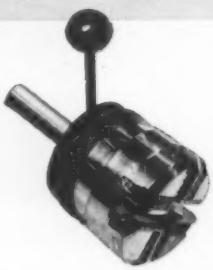
Rotating Die Heads, Type "ORB" with snap action trip and quick change radial type chasers, cut straight threads ⅛" to 5" dia.



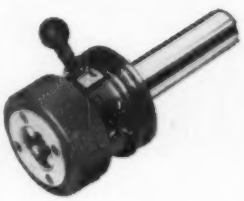
Non-rotating Die Heads, Type "OLB" with pull off snap trip and quick change radial type chasers, cut straight threads ⅛" to 5" dia.



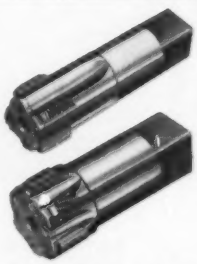
Rotating Die Heads, Type "TRB" with snap action trip and quick change Tangent chasers, cut straight threads 5/16" to 2" dia.



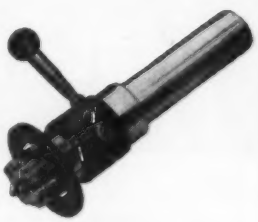
Non-rotating Tangent Die Heads, Type "TLC", with pull-off snap trip and quick change chasers, cut straight threads ¾" to 2" dia.



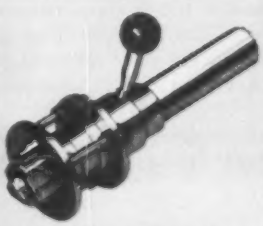
New 4 in 1 Type "ACB" Die Heads, Rotating and Non-Rotating feather action trip, cut straight threads ⅛" to 4" and tapered pipe threads ⅛" to 3½".



Solid Adjustable Taps "EHB" and "RHB" with removable chasers, cut threads 1¼" to 5" dia.—ideal for salvage work.

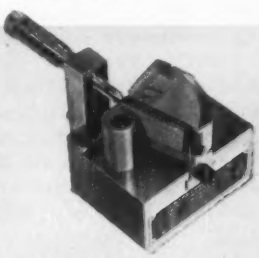


Standard Collapsible Machine Taps, Rotating or Non-Rotating, with easy size adjustment, cut straight threads 1¼" to 7" dia.

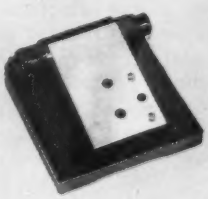


Semi-receding Pipe Taps, Rotating or Non-Rotating, with taper receding action, cut 1" to 6" taper pipe threads. May be arranged for straight threads also.

Type "L" Machine Taps, Rotating or Non-Rotating, with 18 interchangeable nose pieces and 2 bodies, cut a range of straight threads to 6¾" dia.



Tangent Chaser Micrometer Setting Fixture provides longer chaser life and better threads through more accuracy in setting chasers in their holding blocks.



Universal Chaser Grinding Fixture for use on either a surface or cutter grinder assures accuracy in grinding chasers of all types.

For more complete information on Sheffield-Murchey threading tools, get in touch with your local representative or write for Catalog MU-153.

Murchey Division, The Sheffield Corporation
Dayton 1, Ohio, U. S. A.

MASTER CRAFTSMAN SHEFFIELD HEADQUARTERS

SHEFFIELD

6548

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

The Remedy Is Not Strong Enough

A realistic policy regarding tax depreciation allowances on capital goods investments is now in the making in Washington.

The White House and Congressional leaders are committed to it. But there is important disagreement on how liberal the new legislation should be.

The administration is advocating a change in the law to permit manufacturers to write off two-thirds of the cost of new production equipment during the first half of its useful life.

That is a step in the right direction. But it does not go far enough. It gives a company only a small added advantage over what it has now. And what it has today is very little, according to the rules of the Internal Revenue Bureau. These rules stretch out the useful life of a piece of machinery over 15 to 25 years, far beyond the time when most machines still can do work with high efficiency.

Optional depreciation would be much more realistic and practical than the White House program of modified write-offs. It would allow a manufacturer to set his own schedule of amortization. He would write off his new equipment as fast or as slow as he pleases. But once he has chosen the rate, he must stick to it.

Another plan, which falls halfway between the administration's proposed mild modification of present rules, and complete abandonment of those rules in favor of optional depreciation, is to let a manufacturer write off 50% of the cost of capital equipment in the first five years, regardless of what its useful life might be.

The need for changing the depreciation policy has been painfully evident for a long time. The 1953 American Machinist Inventory of Metalworking Production Equipment revealed the fact that the nation's metalworking shops are cluttered up with an appalling amount of obsolete, inefficient, high-cost machinery.

Never before since the war have so many newly designed modern machines been offered to Metalworking as today. For proof take a look at the hundreds and hundreds of new machines put on the market the past year and described in this issue of American Machinist.

Yet government tax rules, in force virtually without alteration since 1934, discourage manufacturers from ridding their shops of old machines when better ones have been developed.

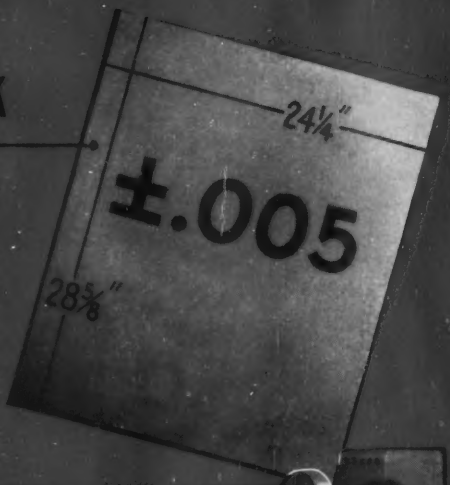
Prompt enactment of a new law at this session of Congress authorizing more rapid depreciation will help immensely to stimulate the modernization of our metalworking plants. The more liberal the rules are made, the deeper the effect on putting the nation's physical plant into the best possible shape to meet peacetime and wartime requirements.

The White House proposal deserves applause as a starter. It will get the depreciation problem off dead center. But it falls considerably short of licking the problem. That can be done only if manufacturers are allowed to recover their capital much more rapidly than is proposed.

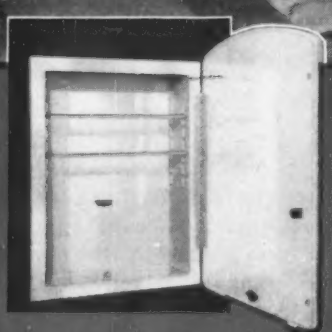
Burnham Finney

THIS accurate BLANK saves money

ALL ALONG THE LINE



Photos Courtesy The F. H. Lawson Company



These accurate blanks are held to tolerances of ± .005" on Cincinnati Shears in the shops of The F. H. Lawson Company, manufacturers of medicine cabinets, pails and all sorts of containers.

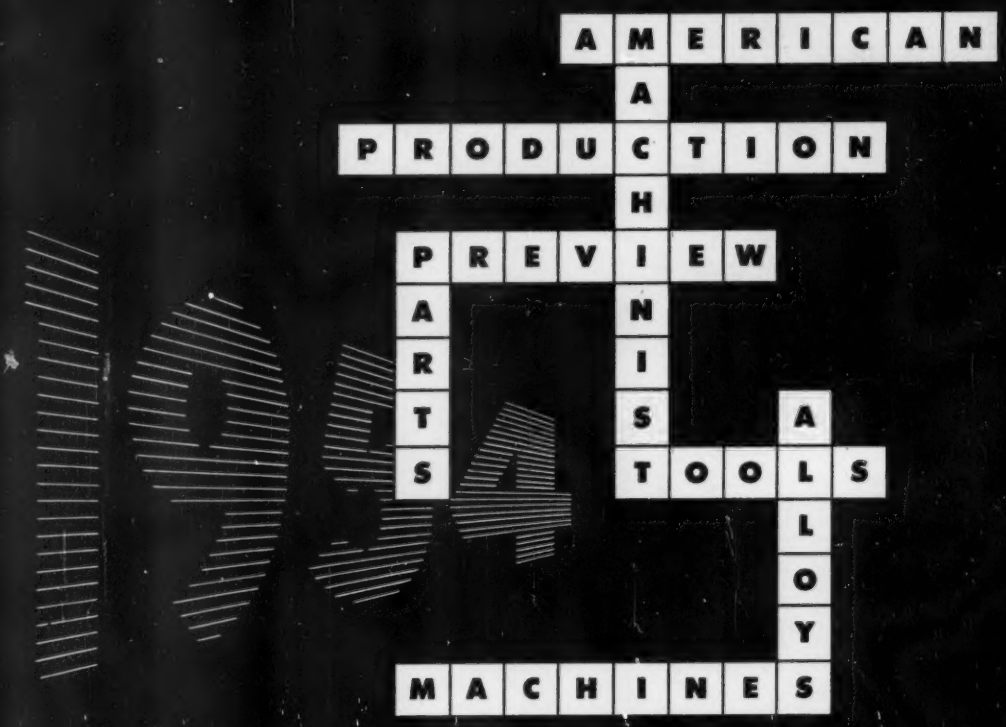
In lots of 10,000 at 400 an hour these 24½" x 28⅝", 26 gauge blanks are produced with such accuracy that production costs all along the line are low. One and one-half to two million cuts are made before knives need regrinding . . . another important factor in the low cost. Rejects and reworks are very few. Only accurate blanks bring low cost forming and assembly.

Write for Catalog S-6.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



the 41st annual review

of new metalworking equipment, parts, and materials.

these items were described

in the pages of American Machinist during 1953 . . .

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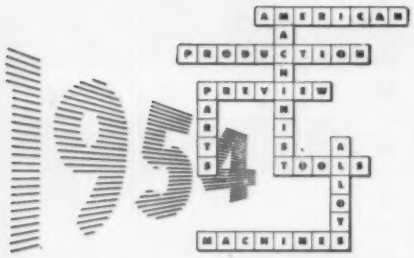
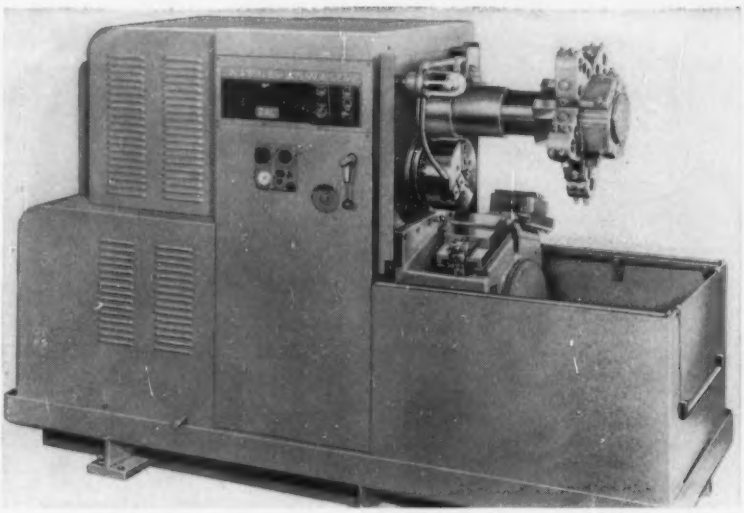


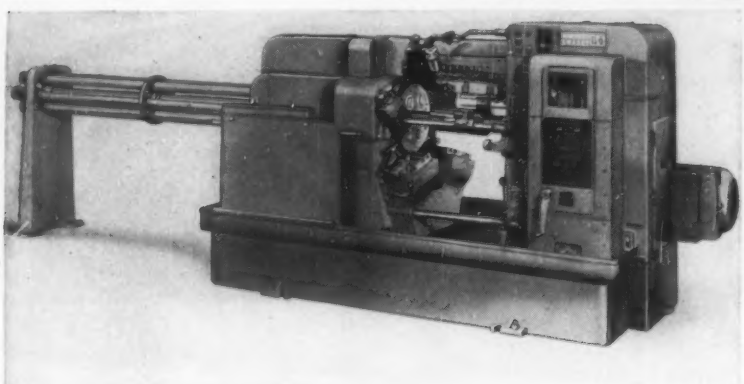
TURNING

summarized from descriptions published during 1953

AUTOMATIC CHUCKING MACHINE —*The Warner & Swasey Co, 5701 Carnegie Ave, Cleveland 3, Ohio.* Handles work to 10½-in. dia and 9-in. turned length. Front and rear cross-slides; live-faced overhead turret. Spindle speed range from 40 to 1102 rpm; 36 feeds from 0.0019 to 0.124 in.; max slide travel is 4½ in. Model 2-AC.

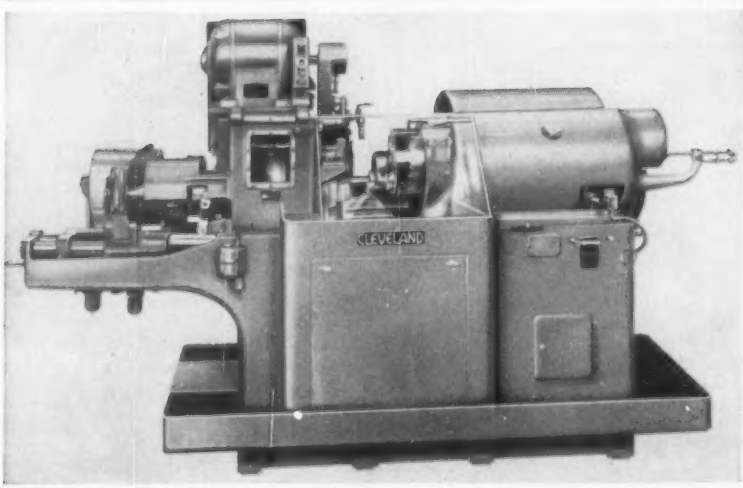


AUTOMATIC BAR MACHINES—*The Warner & Swasey Co, 5701 Carnegie Ave, Cleveland 3, Ohio.* Capacities are ¾ and 1¼ in. Quadrant mechanism eliminates changeable cams; feed strokes are set by positioning trip blocks on calibrated quadrant scales. Elliptical gears power Geneva indexing mechanism. Machines have six spindles; speed range of smaller is 255 to 2781, of larger, 372 to 4045. Turning stroke is infinitely variable from 0 to 5 in.



DUAL PILOT BARS—*Viking Tool & Die Co, 3520 E 43rd St, Minneapolis, Minn.* To reduce vibration chatter, hold closer tolerances, and assure precision cuts on No. 3 & 4 Warner & Swasey ram-type turret lathes. Two stations can be supported with the pilot bar which swings in a small circle from one position to the other.

AUTOMATIC SCREW MACHINE — *British Industries Corp, International Machinery Div, 164 Duane St, New York 13, NY.* Single-spindle; capacity, ¾-in.; 202 spindle speeds range from 63 to 5600 rpm. Spindle is driven by roller chains from gearbox with double-ended friction clutch. Model CVA 12. British—E H Jones.

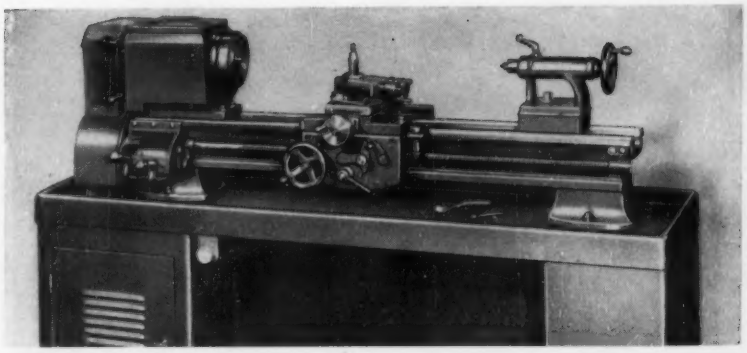


ENGINE LATHE—*British Industries Corp, International Machinery Div, 164 Duane St, New York 13, NY.* Capacity is 12x24 in.; eight spindle speeds range from 52 to 1000 rpm; 36 feeds from 0.002 to 0.068 ipr. Gap models have 19-in. swing. Said to be ideal for training use because of ruggedness, low price, and great number of safety features. British—Colchester.

EXTRA-CAPACITY PUSHER—*Kane Industries Co, 1732 N California St, Chicago 47, Ill.* For B&S automatic screw machines of 1¼- and 1½-in. capacity. Precision made; provided with ball bearings.

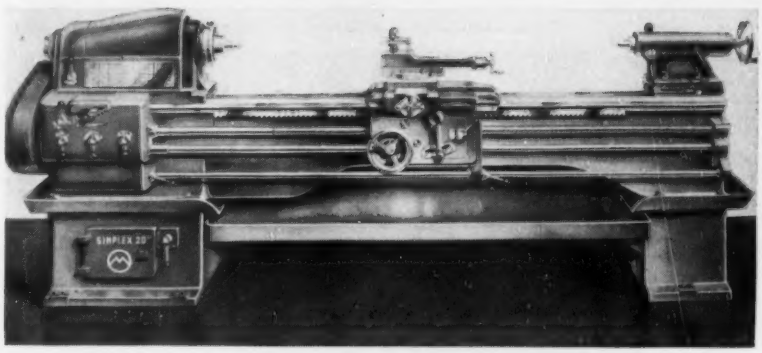
SINGLE-SPINDLE AUTOMATICS—*The Cleveland Automatic Machine Co, Cincinnati 12, Ohio.* Spindle capacity is 2½ in.; 40 spindle speeds range from 69 to 1920 rpm. Features include: Geneva turret index, universal camming, quick-change collets, hand-crank stock-feed adjustment, and four automatic speed changes.

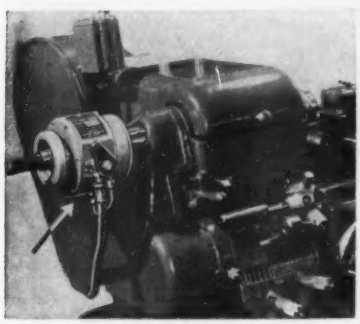
LATHE—*Logan Engineering Co, Lawrence and Lamon Ave, Chicago 30, Ill.* Swing over bed is 12 in. Center distances are 23 to 35 in.; 16 speeds of ball-bearing-mounted spindle range from 38 to 1260 rpm. Carriage features lever-operated disk-type clutch.



HEAVY-DUTY LATHE—*Clausing Div, Atlas Press Co, Kalamazoo, Mich.* Max length between centers is 36¼ in.; swing over ways is 12¾ in., over saddle 7½ in. Collet capacity is 1 in. Head stock has clutch- and brake-equipped countershaft drive.

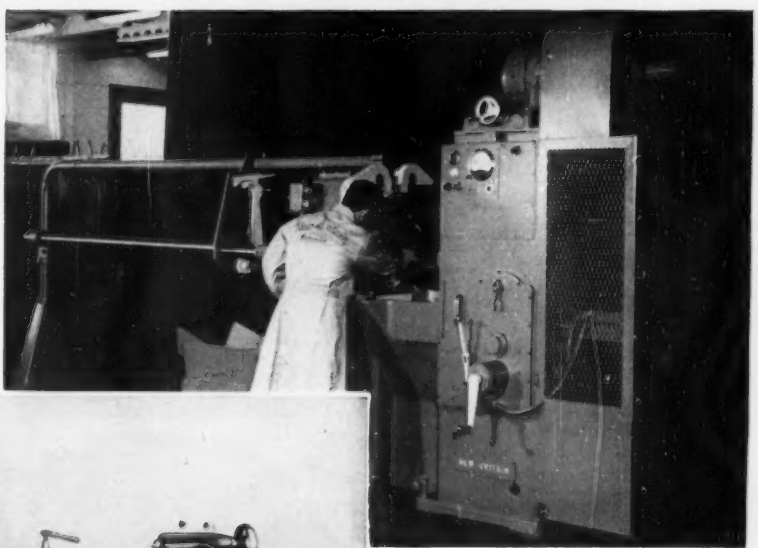
LATHE—*Morey Machinery Co, Inc, 410 Broome St, NY 13, NY.* Capacity of 60 or 78 in. between centers. Removable block-type gap bed swings to 30 in. Norton gearbox gives full range of American and metric standard threads.

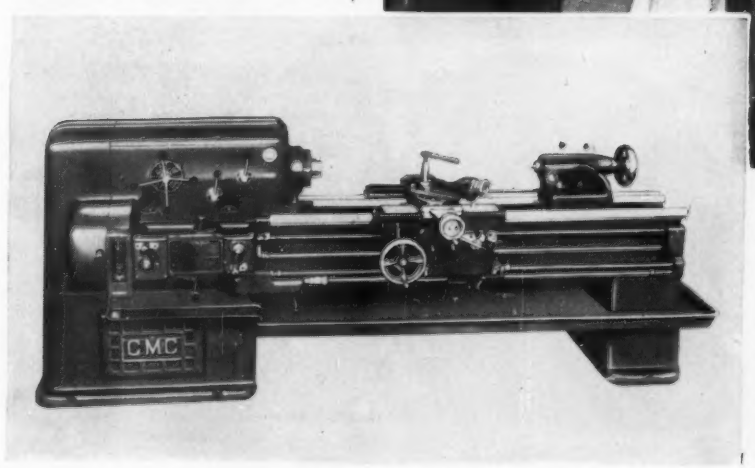




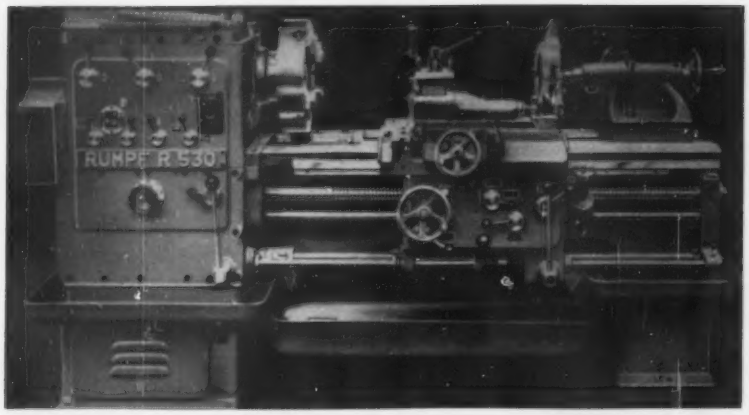
AIR COLLET CLOSER—*Durable Products, 816 W 50th St, Minneapolis, Minn.* For engine and turret lathes of 1-in. bar stock capacity; involves inflation of stationary innertube of Neoprene. Equipment includes mechanism, drawbar, and fingertip valve.

TOOLROOM LATHE—*Pitnam Industrial Products Co, Div of Cement and General Development Corp, 608 Fifth Avenue, New York 20, NY.* Features 16 selective spindle speeds with 15 change gears and 66 feeds. Sizes are 16 and 18 in. Model CMC.

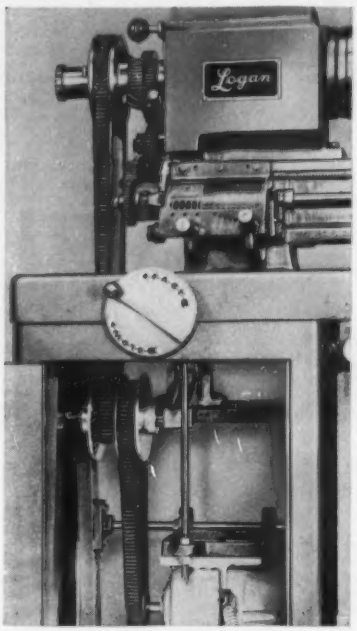




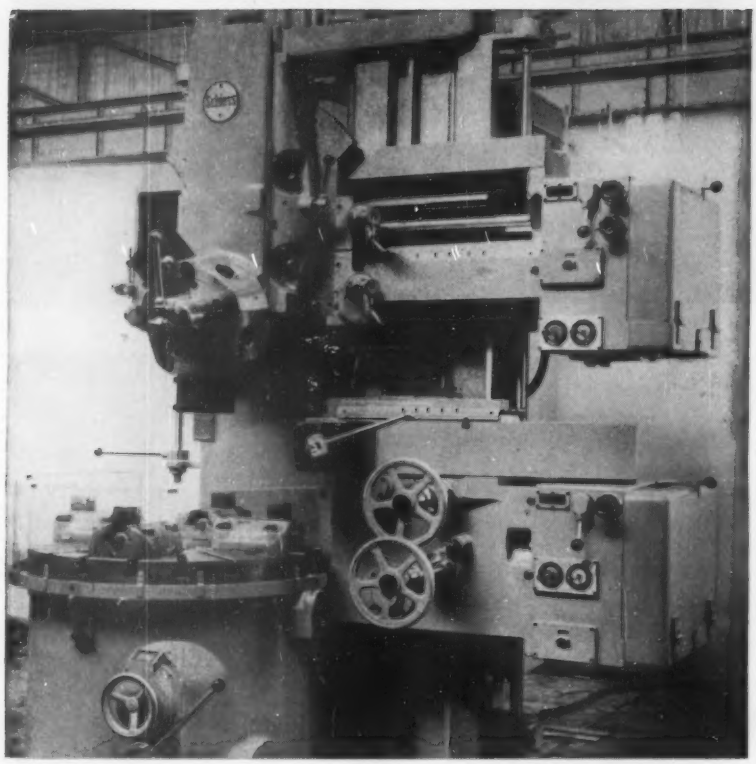
AUTOMATIC BAR MACHINE—*The New Britain Machine Co, New Britain, Conn.* Single-spindle; incorporates program drum, automatic transmission with universal turret cam, and standard cross-slide wedge cams actuated by turret motion. There are no turret cams or cross-slide cams to change, no feed gears to make. Cross-slide cams are chosen by ratio, turret feed is obtained from universal turret cam by changing shifter arm, and turret feed stroke is varied by locating brake cam on program drum. Feed strokes to 6¾ in. with ten feed rates from 0.003 to 0.060 ipr; spindle speed stepless from 80 to 1500 rpm. Model 126.



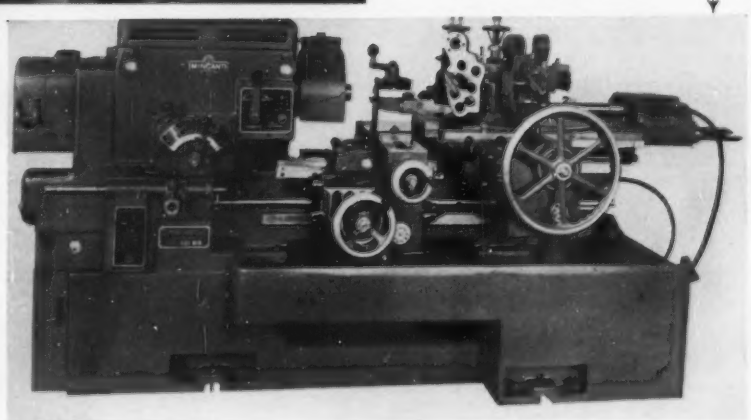
PRODUCTION LATHES—*Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, NY.* Geared-head engine lathes have quick-change gearboxes for cutting 40 US standard threads, 40 metric threads, 40 worm threads, and 40 metric module worm threads. Type N machines have swings from 16 to 28 in. and each has 12 spindle speeds. Type R lathes have 18 spindle speeds. Belgium—Progres.



LATHE TRANSMISSION—*Logan Engineering Co, Sales Div, 4901 West Florence Ave, Chicago, Ill.* 12-in. lathe offers choice between standard double V-belt drive and variable-speed transmission. The latter permits range of 250 to 1575 rpm and speed can be set while lathe is running.



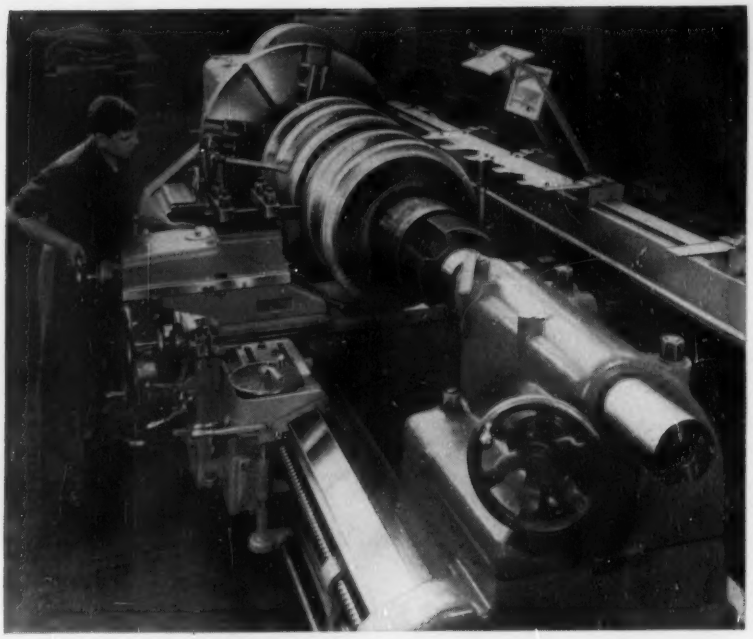
AUTOMATIC TURRET LATHE—*S & S Machinery Co, 140 53rd St, Brooklyn, NY.* Operator runs through cycle by hand, tries speeds and feeds available, then selects proper trip dogs in the hydro-selector. Turret approaches work under hydraulic power at speed of 200 ipm, then drops automatically into mechanical feed range.



VERTICAL TURRET LATHE—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* For high-speed machining with carbide tools. Vertically mounted gearbox; hydraulic pre-selection of speeds; optional copying attachment. 16 spindle speeds in ratio of 1:50; max table speed 310 rpm; 2¾-in. bore. German-Schiess.

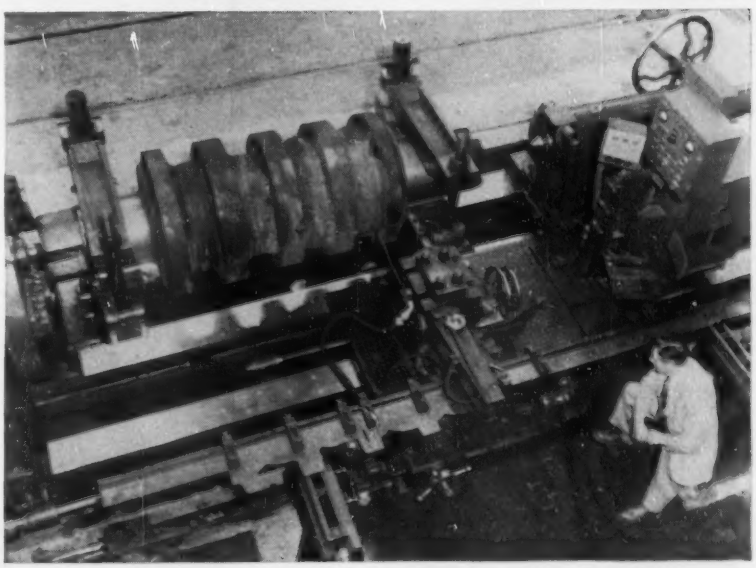
CONTOUR ATTACHMENTS — *Coquipco, 236 S Coronado, Los Angeles 4, Calif.* Pressure works against hardened ground templet instead of workpiece. Although basically for lathes and milling machines, contour grinding can be done by securing spindle to slide on lathe attachment and by using grinding spindle in vertical head of the mill.

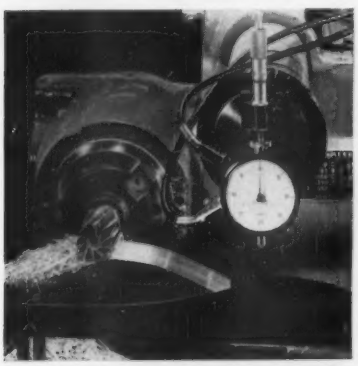
ROLL CONTOURING LATHE — *The R K LeBlond Machine Tool Co, Cincinnati 8, Ohio.* Turns steep-angle contours (40-in. capacity) with two-directional hydraulic tracing. Two hydraulic motors are controlled through single valve as tracing stylus follows contours of flat templet mounted at back of lathe. Hydraulic rapid traverse can retract cross-slide under tracer control. Feed and speed can be varied during a cut; cross feed can be bypassed and longitudinal feed used separately. Cross-slide swing is 28 in. Nine speed changers deliver from 1 to 165 rpm.



AIR-GAGE TRACER—*The Monarch Machine Tool Co, Sidney, Ohio.* For Monarch type EE toolmaker's and production lathes. Tracer is powered by electronic drive. Max dia change at one setting of slide is 3 in. Either flat or round templets may be used.

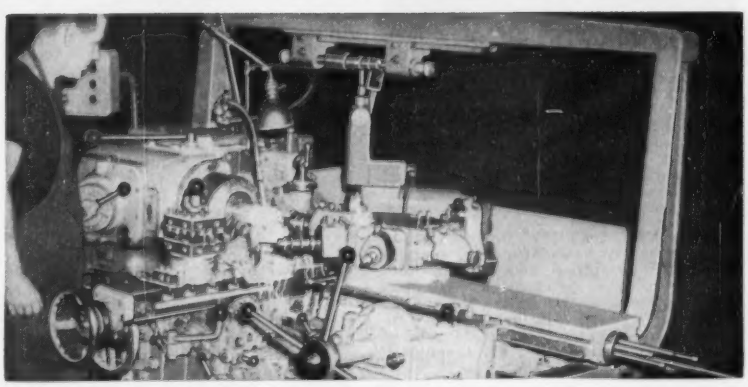
ROLL-TURNING LATHE — *Mackintosh-Hemphill Co, 901 Bingham St, Pittsburgh 3, Pa.* Electronic duplicating equipment controls cutting action; motor-driven tool feeds are controlled by pushbuttons. Accommodates rolls up to 54 in. in dia and 200 feet long; neck diameters range from 11 to 28 in.; spindle speeds up to 32 rpm are available with carbide tools.

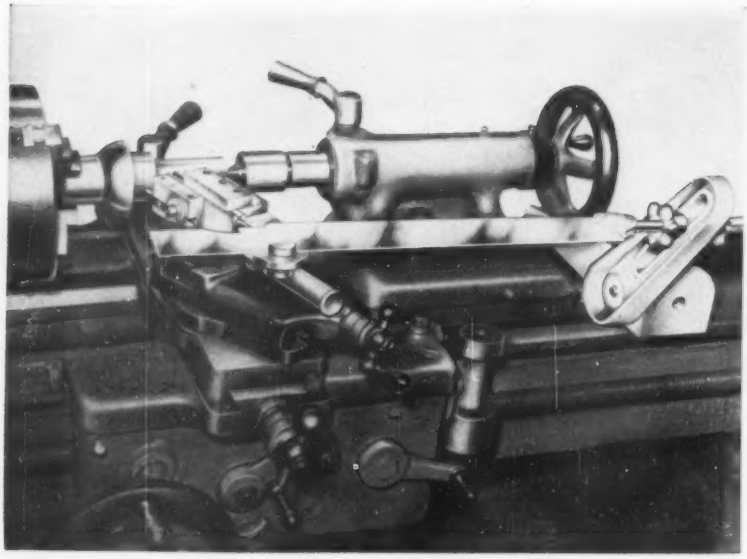




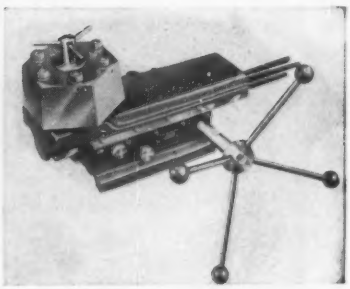
ELECTRONIC CONTOUR SENSOR—*Aerolab Development Co, 230 West Holly St, Pasadena 3, Calif.* Consists of electro-visual sensing head, electronic brain housed in portable cabinet, and Servo drive motor. Unit attaches to leadscrew of almost any machine tool. Brain can be set to compensate for worn ways and leadscrews. Indicator continuously reports accuracy duplicator is maintaining.

HYDRAULIC TRACING ATTACHMENT—*Jones & Lamson Machine Co, 502 Clinton St, Springfield, Vt.* For J&L ram or 7A saddle universal bar or chucking machines. Powered by differential-type cylinder. Tool-carrying slide mounted at 45° angle with spindle axis.

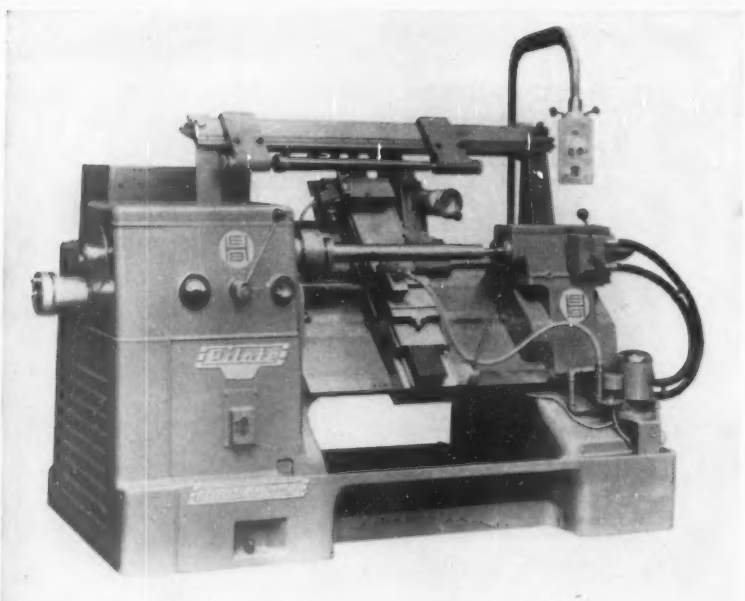


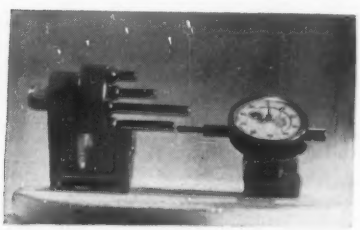


←
PROFILE-TRACING ATTACHMENT —*Lehigh Foundries, Inc, Air Control Div, 1500 Lehigh Drive, Easton, Pa.* For 9- through 13-in. lathes. Boring and ID contours can be turned by same method as conventional OD turning and 90° step can be cut in direction of feed. Installation requires no alteration to lathe. Pro-Tracer model EL-1100.



INDEXING BED TURRET—*A K Tool Co, 2029 Blake Ave, Los Angeles 39, Calif.* For most 10-, 11-, and 12-in. lathes; permits swinging 6-in.-dia tools over the ram; working travel is 7¼ in. Indexing, through clutch, can be manual or automatic.

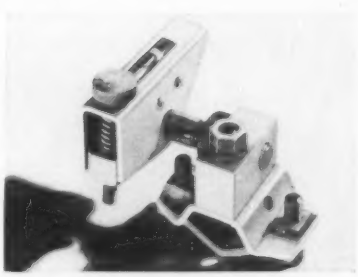




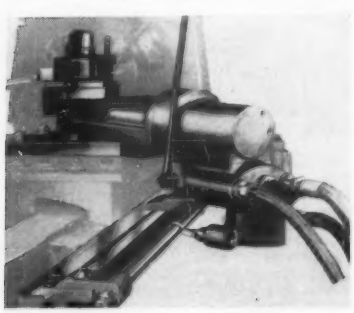
DIAL INDICATOR — *Claremont Instrument Co, 7809 South Claremont Ave, Chicago, Ill.* Enables operator to obtain repeatable accuracy of 10.0005 in. on engine lathes. Indicator holder is mounted on lathe carriage; dial head is mounted on lathe way.

AUTOMATIC COPYING LATHE — *H E B Machine Tools, Inc, 475 Fifth Ave, New York 17, NY.* Uses hydraulic carriage feed and tailstock. Cycle is started with pushbutton and when part is finished, tool returns and spindle stops. Controlling leadscrew reportedly insures that feed per rev remains as set. Speed range is 380 to 3000 rpm, feed range from 0.0015 to 0.035 in. Model 51 has 2-in. spindle bore; model 76 has 3-in. spindle bore. French—H E B Pilote.

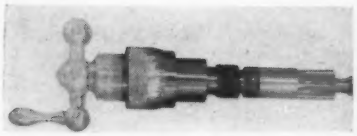
AUTOMATIC LATHE—*Detroit Cam & Tool Co, 195 W Nine-Mile Rd, Ferndale 20, Mich.* Designed for extreme accuracy in mass production of small, slender parts. Parts 12-in. long with less than 4-in. turning length may be produced. Attachments are available for drilling, chamfering, counterboring, and tapping.



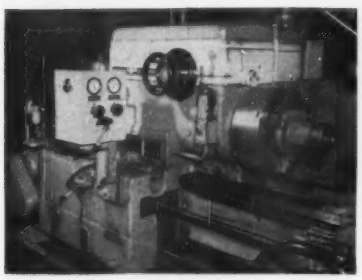
DEPTH-CONTROL DEVICE — *Pekay Steel Fabricators, 865 Sangamon St, Chicago 22, Ill.* Permits bore depth control to 0.001 in. on any turret lathe or hand screw machine. Records amount of pressure against stop at all times. Depthmaster.



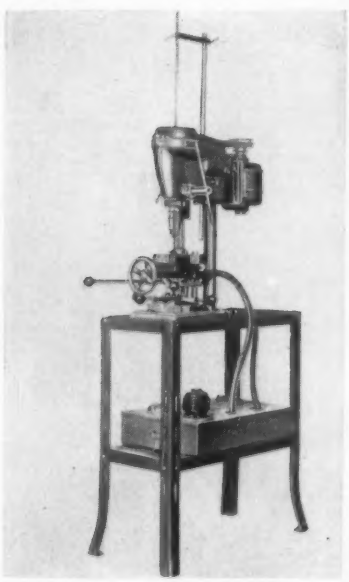
HYDRAULIC COPYING UNIT—*Morey Machinery Co, Inc, 410 Broome St, New York 13, NY.* Now available in two sizes—3¼ in. for lathes from 10- to 15-in. swing, 6 in. for lathes with 14- to 20-in. swing. Basic parts are motor-driven hydraulic pump, templet holder, and hydraulic slide with toolholder.



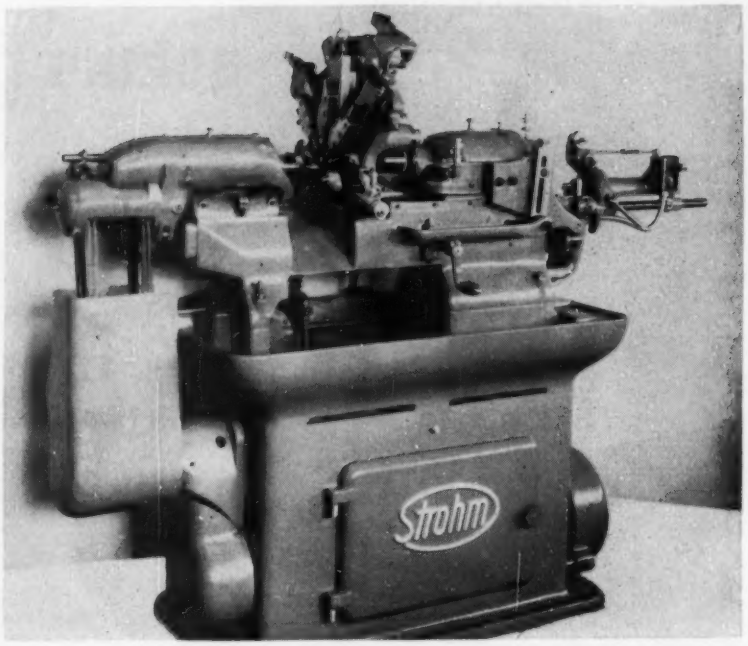
VERNIER ATTACHMENT—*Leon G Arpin Co, 261 Huribut St, Orange, NJ.* Lathe attachment advances tool 0.0001 in. for every graduation of dial. Accuracy does not depend on feedscrew of lathe. Available for nine models. Microturn.

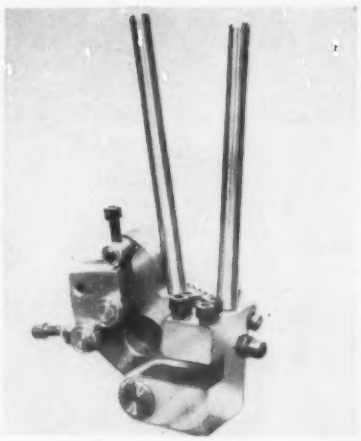


AIR CHUCK CONTROLLER—*Fisher Governor Co, Marshalltown, Iowa.* Provides two preset pressures for pressurizing air cylinder on lathes with air chucks. Dual pressure system is an advantage when castings are being machined. Control valve, two pressure regulators, and gages are mounted in control box. Type 675.



SMALL TURNING MACHINE—*Turnomat Co, Inc, Brockport, NY.* Turns to small diameters in one plunge cut; can taper, knurl, center, form, thread, drill, and ream. Capacity to 1¾-in. bar stock.





FORMING TOOL—*Mark C Walker & Son Co, Orange, Calif.* Hand-operated turret lathe attachment; forms hard steels or soft alloys; handles stock with dia from 3/16 to 2 in.

SMALL LATHE—*MasterSon Engrg Co, Box 4016, Los Angeles 24, Calif.* Portable precision metal-cutting lathe takes work up to 4 in. in length between centers, has 3-in. swing, and ⅛-in. collet capacity. Unit is 10½ in. long, 7¼ in. high, and weighs 12 lb. Uses 110-v ac fan-cooled motor.

LATHE HEADSTOCK—*Morey Machinery Co, Inc, 410 Broome St, New York 13, NY.* Incorporates center gears, planet pinion gears, internal gears, hydraulic cylinders, clutches, and brakes. By planetary gear, hydraulically actuated control is reduced to push-button operation. Bar-stock capacity is 2½x12 in. Turret lathe No. 5.

AUTOMATIC—*Hudson Automatic Machine & Tool Co, 3710 Hudson Ave, Union City, NJ.* Round stock capacity is 20mm; max turning length, 4 in. with flat cam, 6 in. with bell cam. M205. German—Strohm.

DIAL ATTACHMENT—*Robertson & Ruth, Box 534, Elmhurst, Ill.* Attaches to electric or manual hand drill, drill-press, lathe, or milling machine. Three HSS blades are adjusted simultaneously by calibrated die to cut any hole from 1-⅛ to 2½ in. in metal, wood, or plastic. By removing pilot drill, unit can be used as rotary planer. Price: $12.95.

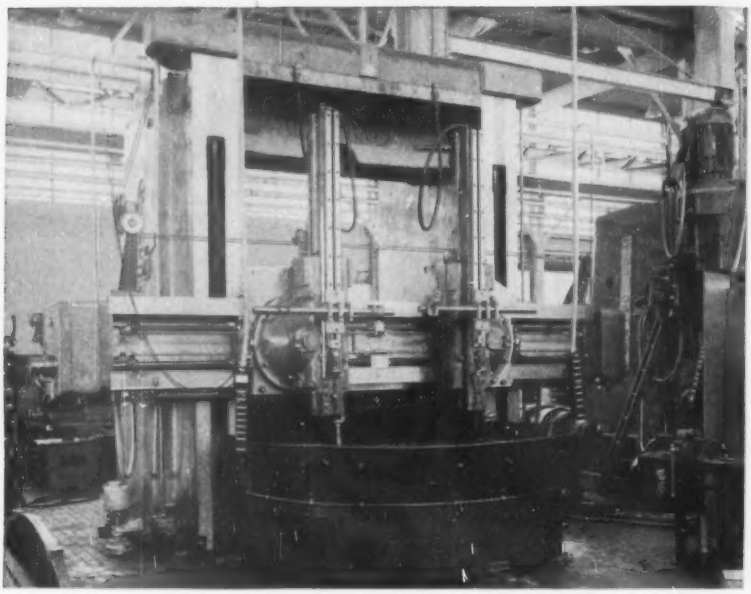
END-FINISHING—*Pines Engineering Co, Inc, Aurora, Ill.* Bench model designed to speed rod-pointing operations. Equipped with air cylinder; electric foot control starts automatic feed and clamp cycle. Handles any length of stock up to 2-in. dia.

END-FINISHING MACHINE — *Pines Engineering Co, Inc, 601 Walnut St, Aurora, Ill.* Air-operated; stroke is 2 in.; max spindle speed, 2000 rpm. Tools and chuck jaw inserts are interchangeable to fit required work diameters. Cycle time, less cutting time, is 1.5 sec. Series 700.

1954 AMERICAN PRODUCTION MACHINES AND TOOLS REVIEW

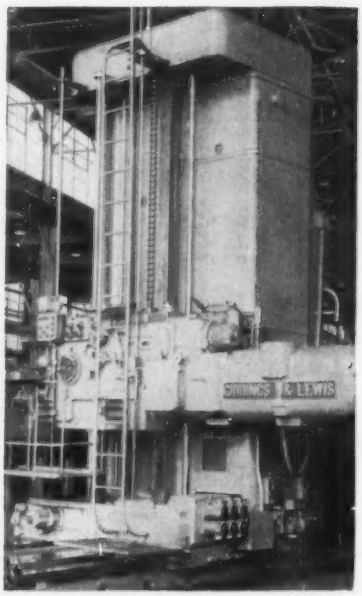
BORING

summarized from descriptions published during 1953



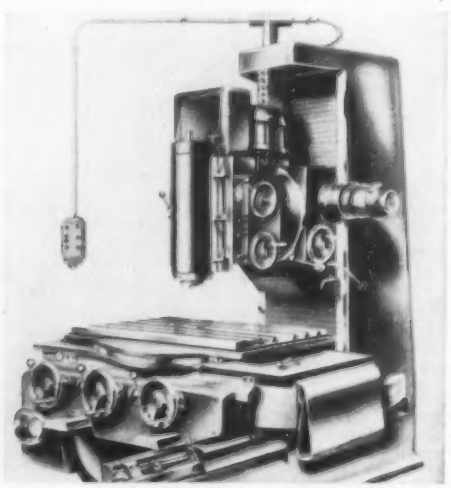
VERTICAL BORING MILL—*Giddings & Lewis Machine Tool Co, Fond du Lac, Wis.* For conventional or contour work by virtue of two additional motors mounted on end of crossrail. 8-ft capacity.

BORING MACHINE—*Bryant Chucking Grinder Co, Springfield, Vt.* Does precision drilling, straight- or contour-turning, and boring, facing, and grooving. Cams and change gears are easily accessible for changing length of stroke or rate of travel. Model 998.

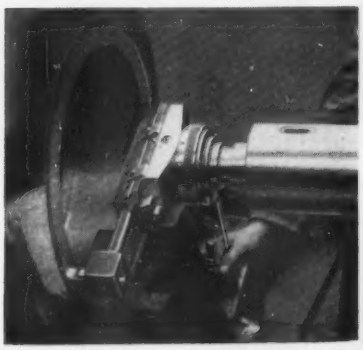


VERTICAL BORING MILL—*Giddings & Lewis Machine Tool Co, Fond du Lac, Wis.* Floor-type boring, milling, and drilling machine now has weldment casting. Headstock height is 13 ft; spindle 8 in.

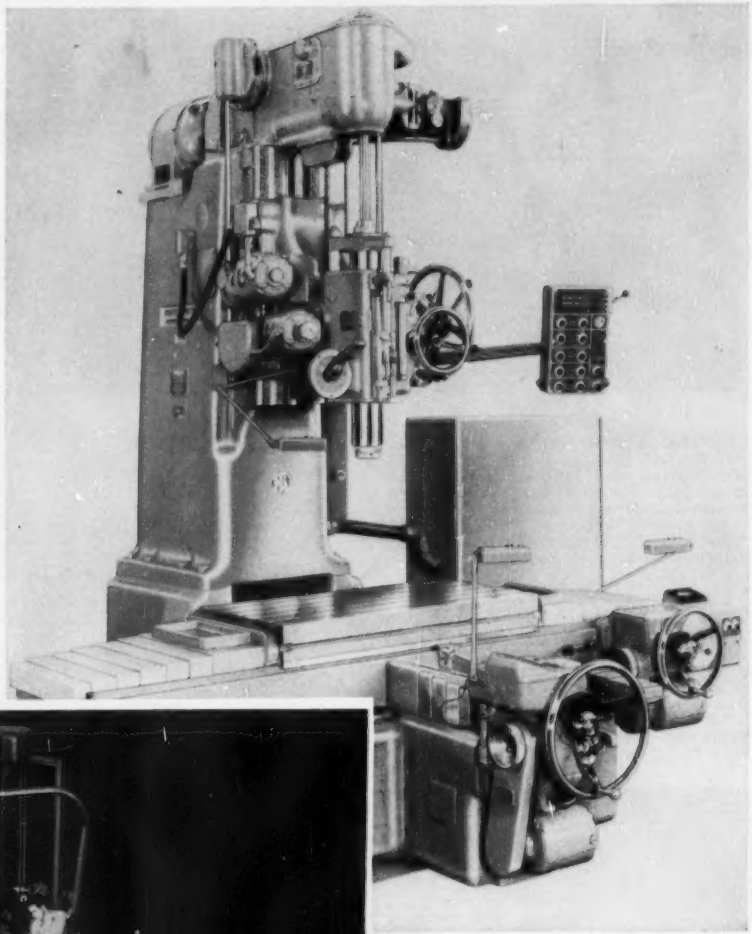
BORING AND MILLING MACHINE—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Handles work with dia to 8 ft. Table feeds are infinitely variable from 0.4 to 39 in.; power feed for circular movement is infinitely variable from 0.7 to 70 in.; spindle speeds range from 36 to 1800 rpm. Swivel column can be turned 180° for radial drilling. German—Bokoe.

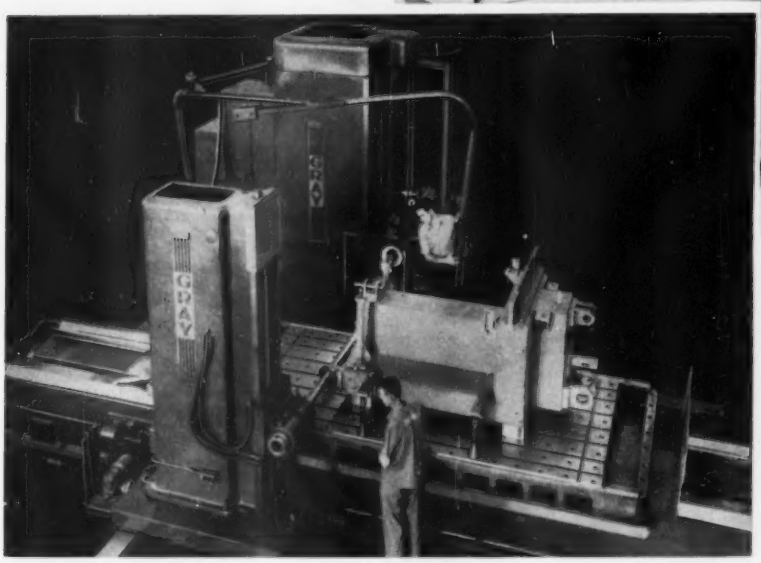


JIG BORER—*Pratt & Whitney, Div Niles-Bement-Pond Co, West Hartford 1, Conn.* With Electrolimit measuring system and pre-loaded ball-roll quill, model 2E is capable of locating and machining to "tenths". Milling feeds from 1 to 15 ipm; spindle feeds (8 steps) 0.0005 to 0.015 ipr; spindle speeds (12 steps) 37 to 1800 rpm.



BORING HEADS—*Karl A Neise, 381 Fourth Ave, New York, NY.* Adaptable to most machine tools. Units have automatic feed, end release and end return, adjustable stop, and can be used for boring, facing, recessing, undercutting, taper, and form turning. German—Karl Neise.

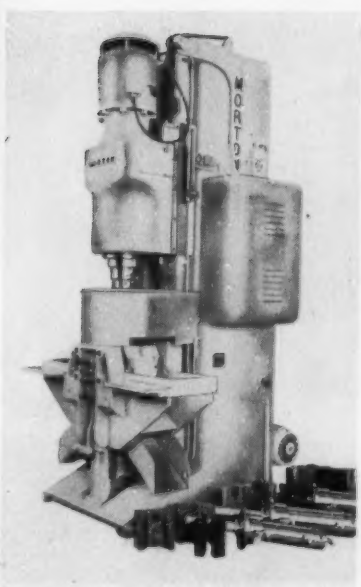




HORIZONTAL BORING MACHINE—*The G A Gray Co, Dept 1, Cincinnati 7, Ohio.* Planer-type for making master gages. Precision indexing is possible to 0.00025 in.

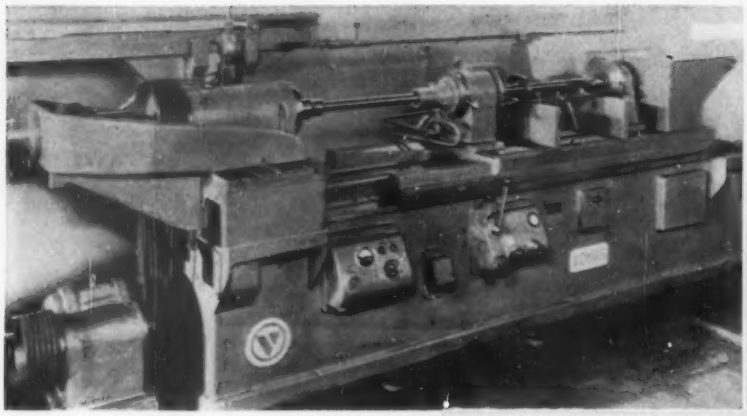
INVERTED BORING MACHINE—*Morton Manufacturing Co, Broadway & Hoyt, Muskegon Heights, Mich.* Bridge-type machine for heavy-duty roughing and finishing operations on large-diameter bores. The 96-in.-dia boring head and supporting bridge are lifted hydraulically to provide clearance for part on traveling fixture. Boring head is equipped with six tool slides and each has adjustable feed. Stops determine final size of finished part.

FACING, BORING MACHINE—*Forney's Inc, New Castle, Pa.* Handles complicated irregular-profile milling and boring of aluminum or magnesium castings and forgings and cast and rolled armor plate. Incorporates duplicator equipment with templets.



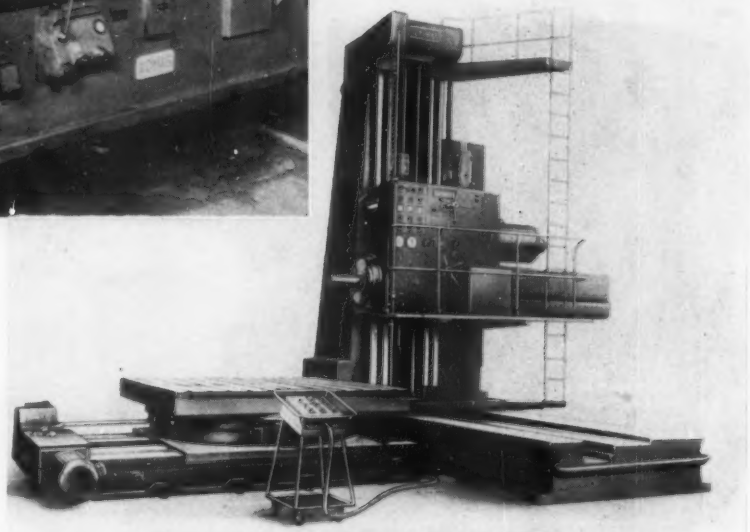
BORING MACHINE—*Morton Mfg Co, Muskegon Heights, Mich.* Vertical boring and finishing machine designed for performing both rough boring before babbitting and finish boring after babbitting of AAR car journal brasses. Spindle is driven through gearbox by 15-hp motor; hydraulic circuit provides power for clamping and for feeding cutters.

BORING

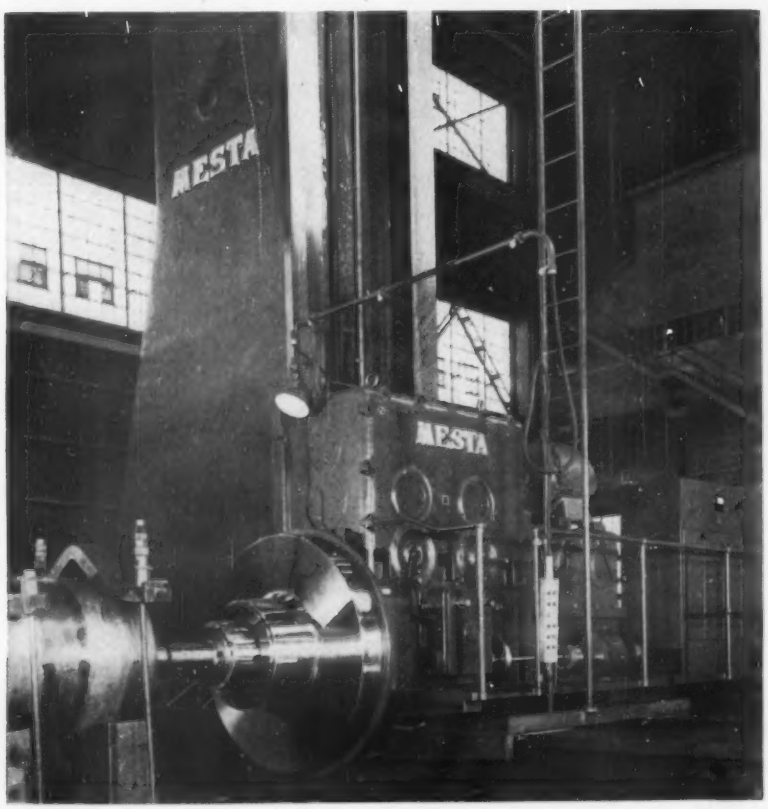


DOUBLE-END MACHINES — *Walter P Hill, Inc, 22183 Telegraph Rd, Detroit 19, Mich.* For boring, chamfering, centering, burring, milling, and flaring operations. Hydraulically powered magazine-feed arrangement and motorized heads equipped with hydraulic feeds. Production rate is said to be over 6000 pieces per hour.

BORING MACHINE—*Morey Machinery Co, Inc, 410 Broome St, NY 13, NY.* For boring and internal-profiling engine parts. Sizing bar is placed in rough-drilled shaft and space is filled with matrix material. Boring bar replaces sizing bar and matrix serves as continuous bearing for boring bar.



HORIZONTAL BORING, MILLING—*Mesta Machine Co, Pittsburgh, Pa.* Bores holes from 3 in. to more than 10 ft in dia. 18-in.-dia spindle has variable speed of 0.75 to 56 rpm with stroke of 8 ft.



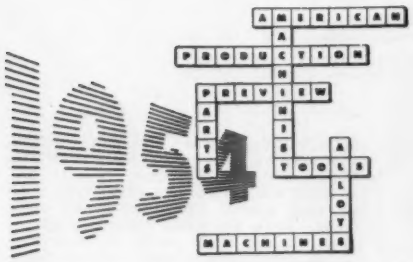
BORING, MILLING MACHINES — *American Schiess Corp, 205 E 42nd St, New York, NY.* Horizontal type with gear drive for roughing and belt drive for finishing. Spindle diameters range from 6¼ to 12⅜ in.

OPTIMETRIC BORING MACHINE—*British Industries Corp, International Machinery Div, 164 Duane St, NY 13, NY.* Spindle speeds are from 80 to 1000 rpm; spindle is adaptable for boring bars, milling cutters, facing tools, and drills. Dials read to 0.001 in. accurate to ±0.00025 in.

JIG BORER POSITIONER — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Enables preselection of table position for next hole while one boring operation is in progress. Uses optical and photoelectrical centering devices. Table settings are guaranteed to be within 0.00015 in. and readings within 0.00005 in. German—Lindner.

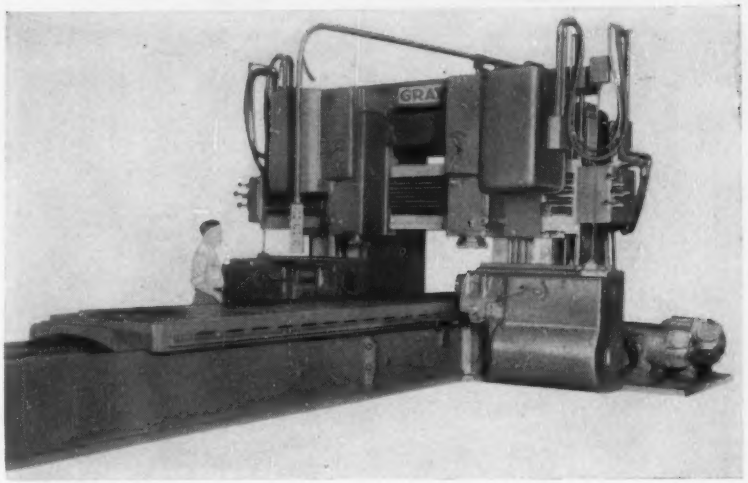
OPTIMETRIC BORING MILL—*International Machinery Div, British Industries Corp, New York, NY.* Optical system for vertical and transverse motions. Settings are said to be accurate to 0.00025 in. Table has three reversible power feeds. British—H W Kearns.

HORIZONTAL BORING MILLS — *Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, NY.* Vertical capacities are 29½, 35, or 43 in.; speeds range from 17 to 910 rpm in 18 steps; 18 feeds range from 0.001 to 0.500 ipr. Tabletop, 31x39 in., swivels 360°; nitrided 3-in. spindle is hardened and ground. German—Wotan.

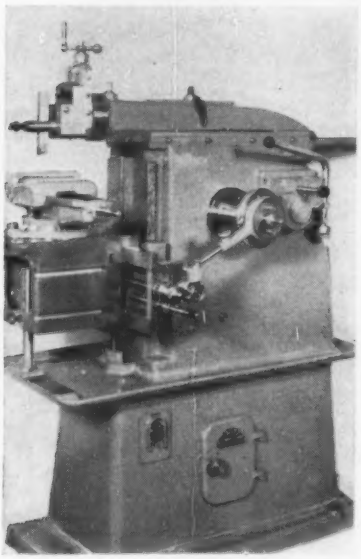


PLANING AND SHAPING

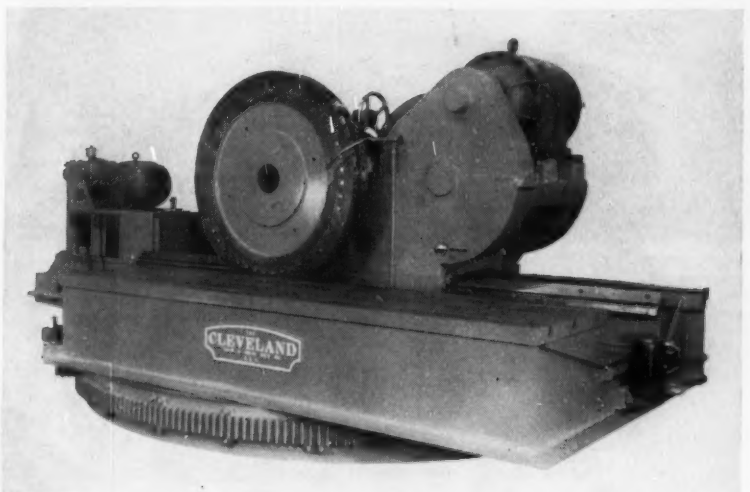
summarized from descriptions published during 1953



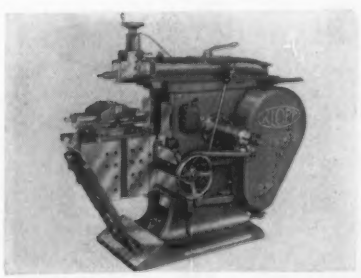
→ PLANER-TYPE MILLER—*The G A Gray Co, Cincinnati 7, Ohio.* Heavy-duty machine has 54x48-in. capacity, 20-ft double housing, and quill diameters of 8⅛, 10, 12, or 14 in. Anti-backlash table drive; non-metallic table ways; unit head construction; Gray planetary transmission; Insto-Shift spindle-speed change. Speeds range from 10 to 500 rpm in 18 steps; feeds of table and heads from 1 to 64 ipm; feed of quills from 0.25 to 16 ipm; feed of rail from 0.375 to 24 ipm.



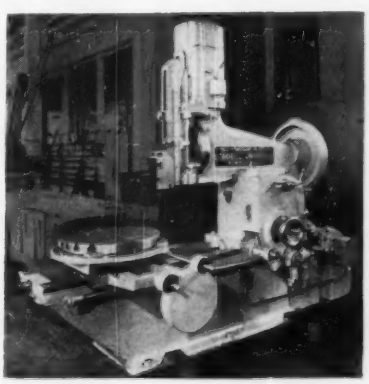
SHAPER—*Austin Industrial Corp, Box 430, White Plains, NY.* Stroke is 10, 11, or 13 in. Six ram speeds, from 30 to 150 spm, and six power feeds are provided. Model 02. Swedish—Prema.



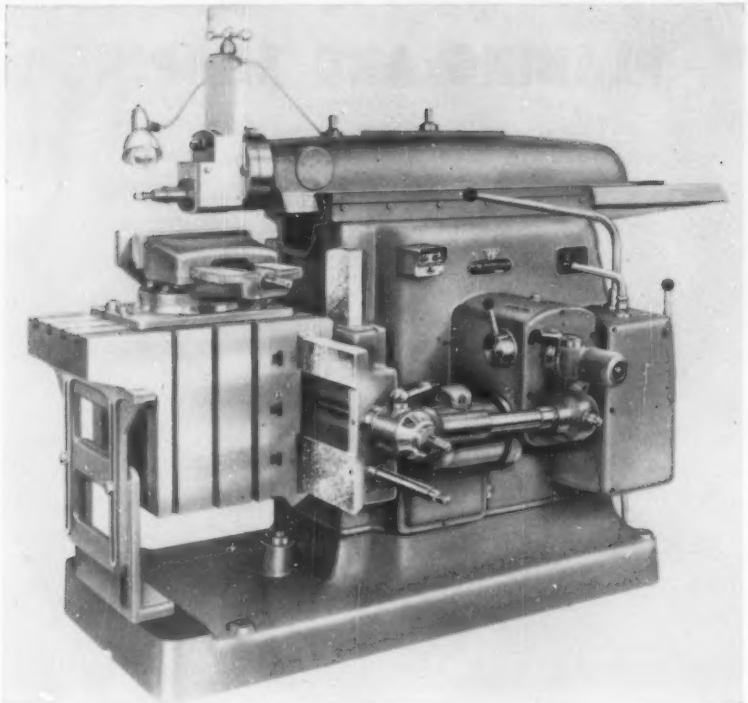
ROTARY PLANER—*Cleveland Punch & Shear Works Co, Cleveland, Ohio.* For milling structural members and castings. Has 48-in. cutter head with 4-in. in-and-out adjustment made from either side by handwheels. Equipped with hydraulic feed; operated by electrical control. Planing length is 7 ft 6 in. with feed from 1 to 10½ in. Cutter head operates at 50 fpm. No. 3.



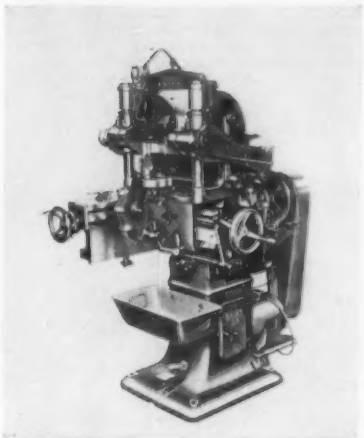
SHAPER—*Kurt Orban Co, 205 E 42nd St, NY 17, NY.* Stroke lengths of 16¾, 20 2/3, and 26⅝ in. Controlled-contact drive keeps friction wheel-drive wheel pressure proportionate to machine load. German—Klopp.



← SLOTTER—*Lobdell United Co, Wilmington 99, Del.* Completely enclosed counterweight on ram; bank of counterweights slide up and down within machined housing. Gear-guarding arrangement encloses all moving gear banks in sections.



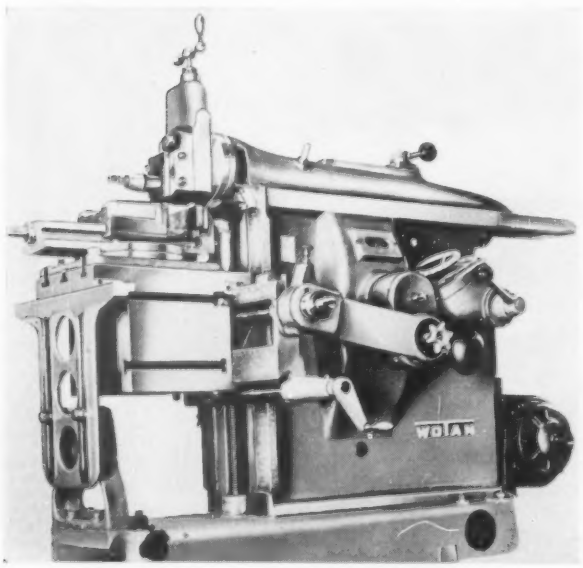
SHAPERS—*Austin Industrial Corp, 76 Mamaroneck Ave, PO Box 430, White Plains, NY.* Model E units have 14-, 18-, or 22-in. stroke and are plain type with six ram speeds and four-power table feeds. Type ES units have 18-, 22-, or 26-in. stroke with plain or universal tables, eight ram speeds, and ten table feeds. Swedish—VMA.

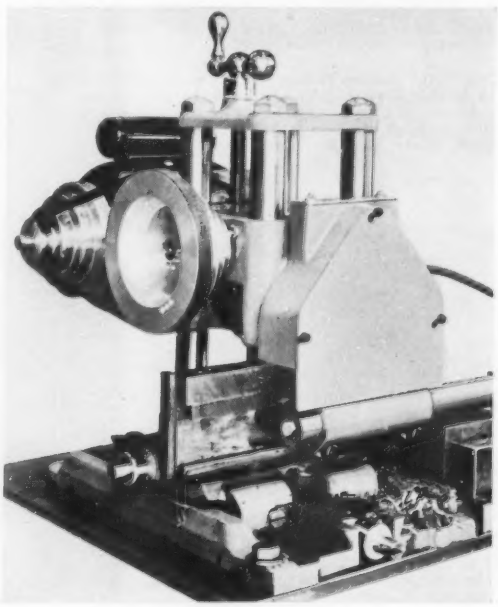


SHAPER — *Parker Machine Co, Inc, Pioneer St, Brooklyn 31, NY.* Ram stroke varies from 1¼ to 16 in., speeds from 24 to 152 spm. Worktable travels by power or hand. Six feeds range from 0.01 to 0.06 in. All driving gears are located inside column. German — Wotan.

INTERNAL KEYSEATER—*Versa-Mil Co 33 W 42nd St, New York 36, NY.* Attachment adds reciprocating tool action to company machines. Cuts internal keyways with widths from ⅛ to 1 in. and bores from ½-in. dia up. Stroke is adjustable from 0 to 5 in. in length and 360° in angle. Tolerances are reportedly within 0.001 in.

PUNCH SHAPER—*International Machinery Div, British Industries Corp, 164 Duane St, New York, N.Y.* Machines a blanking punch, hob, or profile part directly from solid in one operation. Stroke of shaper is adjustable from 1½ to 4½ in.; punch can be sheared into die to depth of 1/32 in. British—E H Jones.

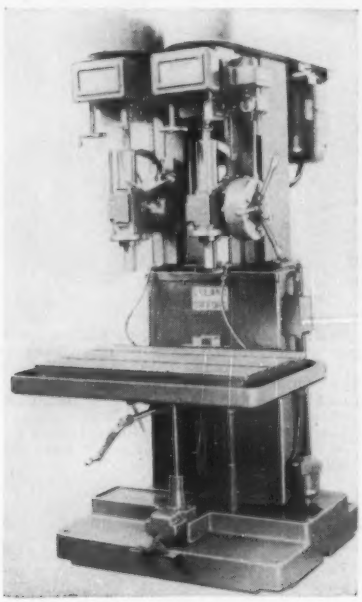




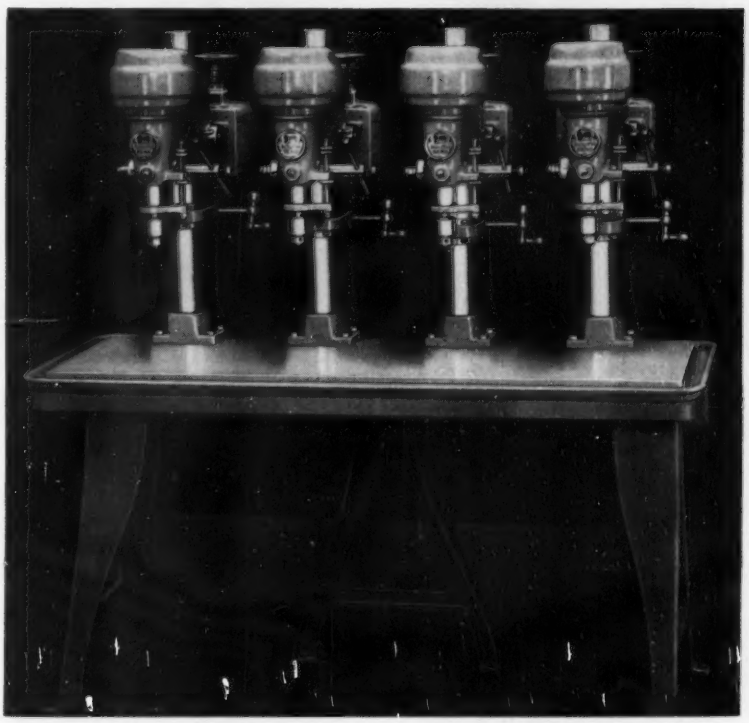
1954 AMERICAN PRODUCTION AND MACHINE TOOL LOOK

DRILLING

summarized from descriptions published during 1953

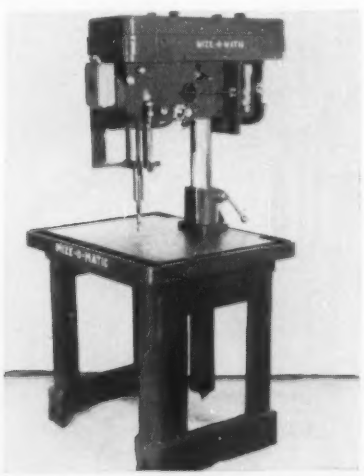


DRILLING MACHINE — *Leland-Gifford Co, Worcester 1, Mass.* From 1 to 4 spindles drill holes to 1½-in. dia in cast iron or 1¼ in. in steel. Eight standard speeds; three power speed rates; hydraulic, power, or hand feed; 24 in. swing. No 3MVB.

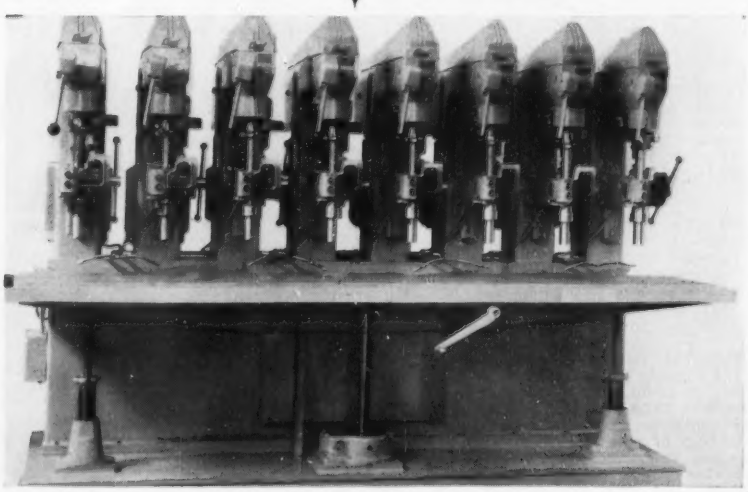


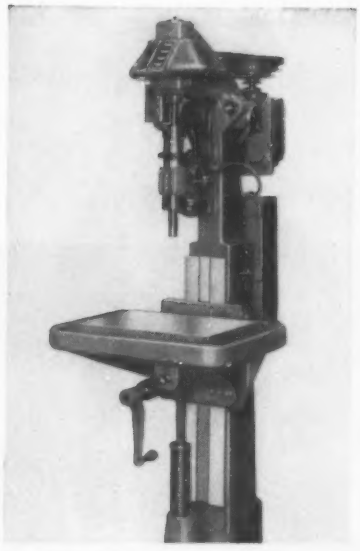
DRILLING MACHINE — *The Avey Drilling Machine Co, Cincinnati 1, Ohio.* Eight spindles, 15-in. center distance between spindles. Head travel is 7 in., rack travel, 6 in. Spindles are individually driven by 2-hp 1200-rpm motors; six spindle speeds are provided. Design allows hand feed, power feed, and tapping.

PRODUCTION DRILLPRESS—*South Bend Lathe Works, 425 E Madison St, South Bend 22, Ind.* Equipped with from one to four drillheads; for multiple operations involving drilling, tapping, reaming, burring, and chamfering. Spindle speeds range from 720 to 4325 rpm; max capacity is 18 in. from chuck to table.

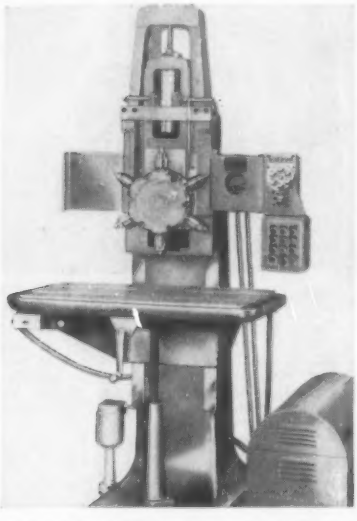


DRILL UNIT—*Mize-O-Matic Inc, 5718 St Jean Ave, Detroit 13, Mich.* Hydraulically controlled air power does automatic drilling, tapping, and indexing. Head is elevated hydraulically and has 24-in. travel and 360° swivel.





DRILLING MACHINE—*Avey Drilling Machine Co, Cincinnati 1, Ohio.* V-belt drive provides spindle speeds to 12,000 rpm. Spindle capacity ranges up to No. 1 Morse Taper drills.

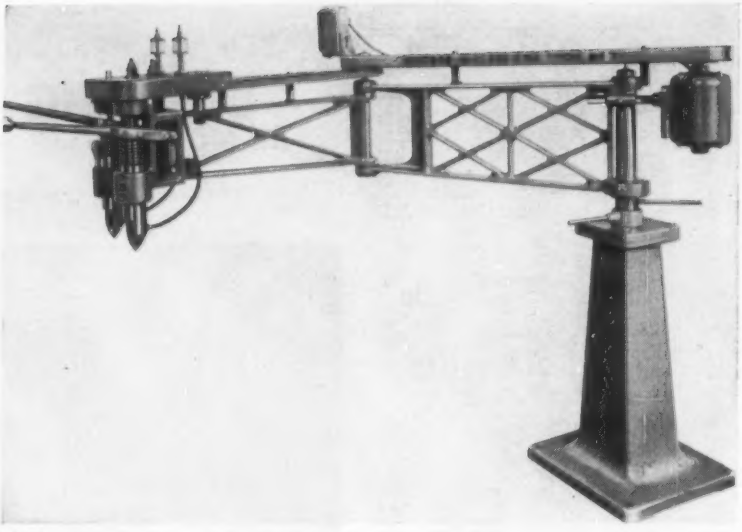


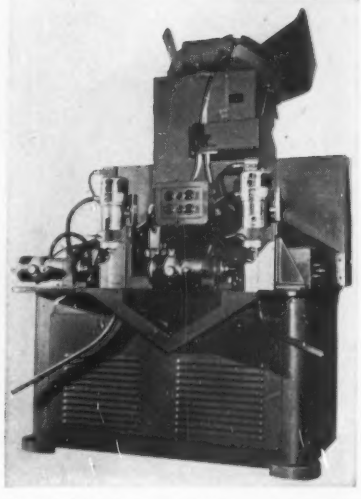
TURRET DRILL—*Burg Tool Manufacturing Co, Los Angeles, Calif.* Infinitely variable hydraulic feed can be manually controlled. Each spindle has 12 preselective speeds. Table travel is 19 in. Model 2BH.

CENTERING, DRILLING UNIT—*Machine & Tool Co, 29-28 41st Ave, Long Island City 1, NY.* Double-end machine for centering round, square, hexagonal, and octagonal pieces; special stop fixes axial position. Model CME. Swedish.

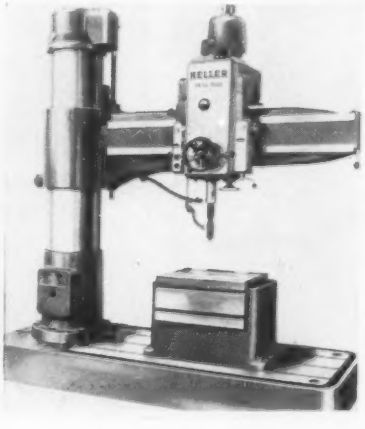
→

RADIAL DRILL—*Heller Machine Co, 114 Liberty St, NY 6, NY.* Drills up to 2½ in. from solid at any of 12 spindle speeds ranging from 33 to 1500 rpm. Preselector gear-changing permits selection of spindle speed for next hole while previous one is being drilled. Series RB.



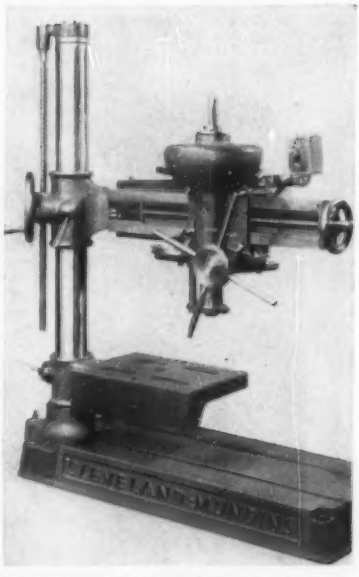


AUTOMATIC DRILLING MACHINE—*Inter-Lakes Engineering Co, 4845 Bellevue, Detroit 7, Mich.* For secondary operations on screw machine parts to 1-in. dia and 2 in. long. Double feed allows larger production at slower operating speeds. Rate is 3000 parts per hr.

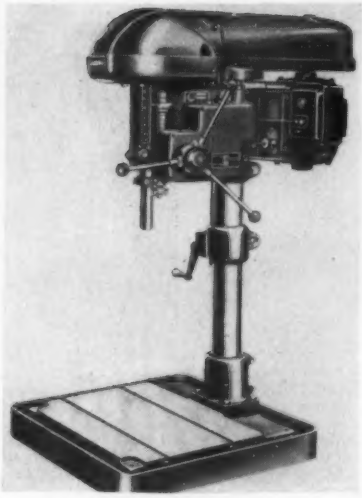


RADIAL-ARM DRILL—*Ekstrom, Carlson and Co, Dept M-1, 1400 Railroad Ave, Rockford Ill.* Double-spindle models have 30- or 71-in. reach. Max vertical spindle travel is 4½ in.; drill-chuck capacities are 0 to ⅝ in.; distance between centers of spindles is 6 in.; dual spindle speeds are 5000 and 8000 rpm.

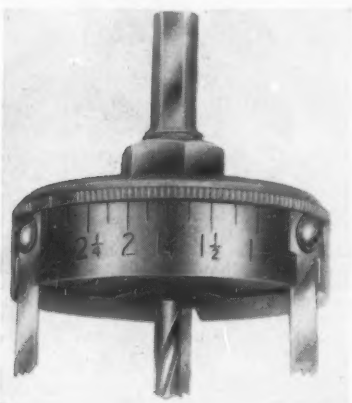
MULTIPLE DRILLER—*B M Root Co, York, Pa.* Rectangular-hood type; universally adjustable spindles; hydraulic table feed. Feed rate is stepless. Model F400.



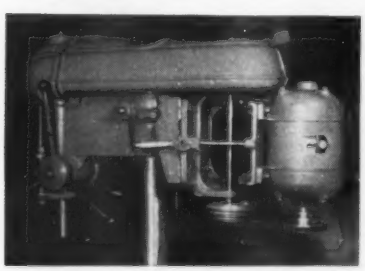
BENCH RADIAL DRILL—*The Cleveland Tapping Machine Co, Canton Ohio.* Munding drill now manufactured and sold by Cleveland. Capacity in tool steel is 1½ in. Eight spindle speeds vary from 160 to 3140 rpm.



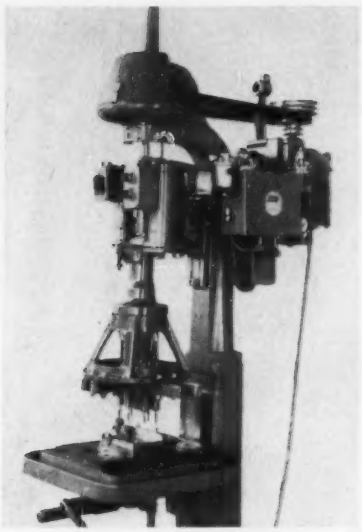
PRESS—*Atlas Press Co, Clausing Div, Kalamazoo, Mich.* Power-feed; 18-in. capacity. Four rates of feed, plus idling position for hand feeding.



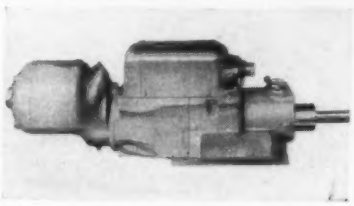
DIAL ROTARY PLANER—*Erwood, Inc, 1770 W Berteau Ave, Chicago 13, Ill.* Fits ⅜- or ½-in. chuck of power drill or drillpress. Turning calibrated dial adjusts three sliding blades to cut holes from 1-⅛ to 2½ in. Furnished with three molybdenum-HSS metal-cutting blades and a set of wood-cutting blades. Price: $12.95.

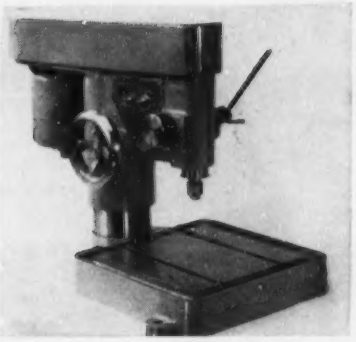


SPEED CHANGER—*Boyd Machine, Inc, Royal Oak, Mich.* Fits any drillpress from 17 to 20 in. Permits changes from 125 to 4000 rpm with 1725-rpm motor.



DRILLING, TAPPING MACHINE — *The Beckett-Harcum Co, Inc, Wilmington, Ohio.* Model C-16 for drilling and C-16-T for drilling and tapping have electrically controlled air-power thrust. Both models are equipped with dual air cylinder transmission. Speeds and thrust are infinitely variable; max thrust is 980 lb at 100 psi; stroke length is 4 through 6 in.

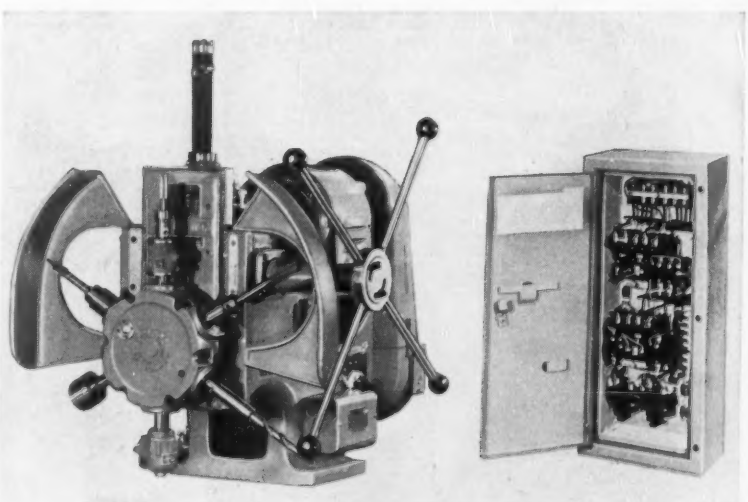




BENCH DRILLS—*Fasma, Inc, 2 Park Ave, New York 16, NY.* Capacities of ¼, ⅜, and ½ in.; eight speeds to max of 18,000, 9000, and 5000 rpm respectively. Drillhead weight is counter-balanced by loaded springs and head rotates left or right. French.

DRILLING-TAPPING MACHINE — *Burg Tool Manufacturing Co, 3743 Durango Ave, Los Angeles, Calif.* For straight drilling operations, forming for ID or OD turning, tapping, threading, plunge-cut end-milling, large counterboring, and spotfacing. Automatic; hydraulic. Eight spindles; 1¼-in. drill capacity; 12-in. spindle and head travel; 19-in. table travel; 17½-in. throat clearance. 12 spindle speeds from 167 to 1765 rpm. Model 3-BH.

←
HYDRAULIC DRILL UNIT — *Delta Power Tool Div, Rockwell Mfg Co, 400 N Lexington Ave, Pittsburgh 8, Pa.* For heavy duty drilling, tapping, reaming, spotfacing, hollow milling; stroke adjustable from 0 to 6 in., depth held within 0.005 in. Uses 1¼-in. drill, has 1800-lb thrust with 80-psi air pressure. Approach at 5 ips; return at 4 ips max. No. 1960.



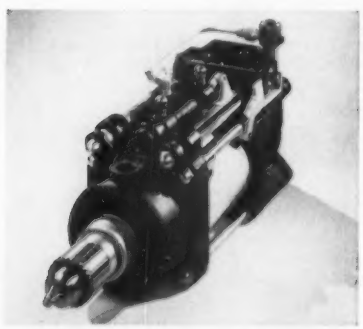
RADIAL DRILLS—*S&S Machinery Co, 140 53rd St., Brooklyn 32, NY.* Preselector speed-change lever eliminates necessity of passing through intermediate speeds. Machine does drilling, boring, tapping, facing, and reaming operations on range of materials from cast iron to aluminum. Caser.

↑
FLANGE-MOUNT UNIT—*Burg Tool Mfg Co, 3743 Durango Ave, Los Angeles 34, Calif.* Mounts on any type of base and two or more machines can be mounted on same base at various angles. Three spindles; 8-in. spindle travel; total of 12 speeds, 225 to 3000 rpm.

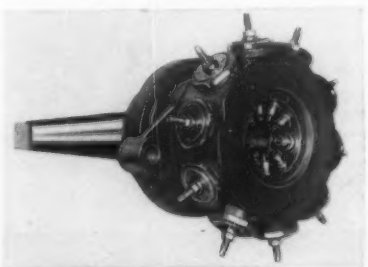
DRILLING, TAPPING MACHINE — *The Avey Drilling Machine Co, Inc, Cincinnati 1, Ohio.* Drillhead is Avey cam-feed unit or Aveydraulic unit. Feature of machine is electrical indexing table slowed by dynamic braking and reversed by precision switch for accurate indexing with non-accumulative tolerance of 0.01 in. max between adjacent holes at dia of 30 in. Standard index range is from 2 to 100 stations.

BAR MACHINE — *The Miller Glass Engineering Co, 148 S Glenwood Ave, Columbus 8, Ohio.* For fabricating nut blanks with dia from ¼ to 2 in. Twin spindles may be operated independently of each other to cut two sizes at two different spindle speeds. Bar stock and drill are simultaneosuly revolved in opposite directions. Handles bars to 20 ft long. Machine is an improved Budd-Ranney model.

16-SPINDLE DRILLHEAD — *Thriftmaster Products Corp, 1070 N Plum St, Lancaster, Pa.* Straight-line drive provides multiple drilling of series of models of trowel handles. Standard and special variations are available.



AIR DRILL — *Hause Engineering, Montpelier, Ohio.* For single- and multiple-feed-rate operations; suitable for automatic or manual cycle control. Stroke is adjustable to 4 in. with thrust for drilling ½-in. dia in steel. Speeds are 500 to 15,000 rpm.



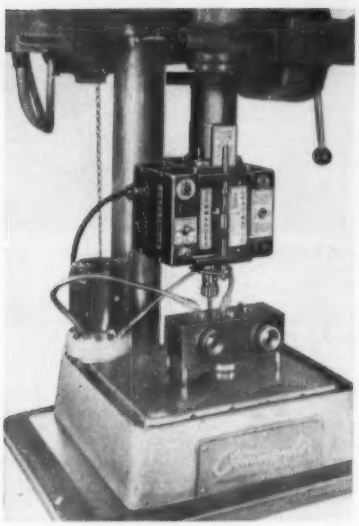
SPLINE-CUTTING ATTACHMENT— *Earle G Boyer, Box 4909, Philadelphia 19, Pa.* Developed for machining straight and spiral flutes by unskilled personnel. Taper shank is provided for mounting attachment in drillpress. Splines may be continuous or interrupted.

RADIAL DRILLPRESS CLAMP — *Clamp-All Co, 895 Montford Rd, Cleveland, Ohio.* Can be used with any size and shape which has clamping surfaces within ¼ to 11 in. from machine bed. Consists of hardened T-slot bolt and flange nut, cast clamp post, and two interchangeable cast arms.

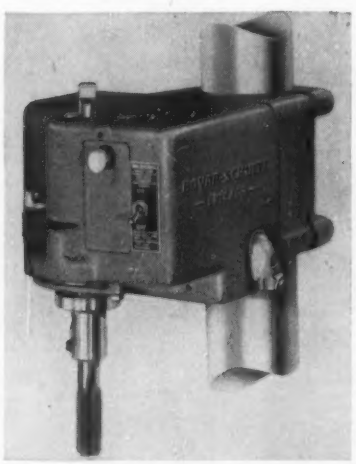
1954 AMERICAN PRODUCTION MACHINE TOOLS REVIEW

TAPPING AND THREADING

summarized from descriptions published during 1953



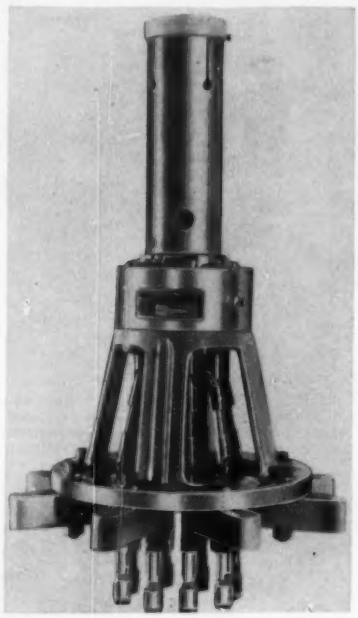
LEADSCREW TAPPER—*Commander Mfg Co, 4225 W Kinzie St, Chicago, Ill.* Automatic; electrically controlled; range of No. 0 to ¾ in. Does not reflect inaccuracies of drillpress. Lead-Matic.



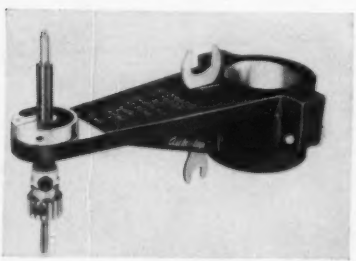
TAPPING HEAD — *Boyar-Schultz Corp, 2124 Walnut St, Chicago, Ill.* Attaches to any drillpress; produces any class thread; foot control frees hands. Taps to ⅞-in. dia usable with standard adapter bushings.

TAPPING COMPOUND—*Grether & Grether, PO Box 47, Stockton, Calif.* Said to free stuck taps and reamers instantly. Compound is non-flammable. Tap Magic.

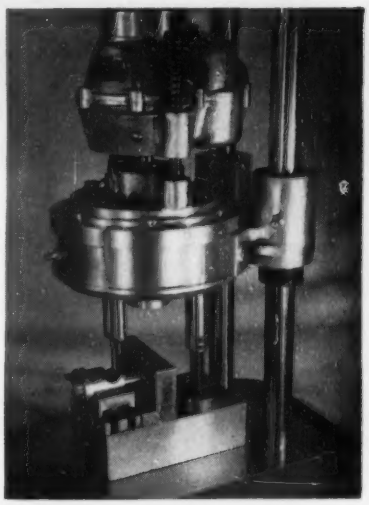
METAL CUTTING FLUID—*The Metalloid Corp, 514 North Jefferson, Huntington, Ind.* Dynatomic; said to give low-rupture energy advantages to tapping and threading as X-60 series cutting fluids provide for production machining. Can be used for tapping stainless steel and titanium. Can be applied by hand, paint brush, or pressure-type oil can. Tapeze.



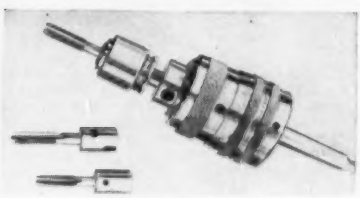
TAPPING HEAD—*Errington Mechanical Laboratory, Inc, Staten Island 4, NY.* Universal joint, multiple-drill, adjustable auto-reverse head for mass production work. Heads are designed to tap two, three, or four holes within 5¼-in.-dia circle.



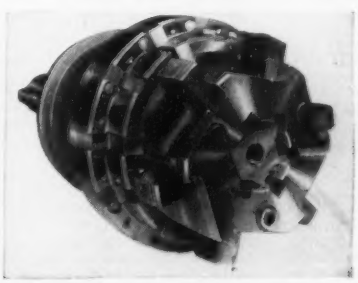
TAPPING ATTACHMENT — *Automatic Methods, Inc, Div 16, 42 Walnut St, Newark 2, NJ.* For use in standard drillpress. Rolled-thread leadscrew works in adjustable split nut to carry driving load.



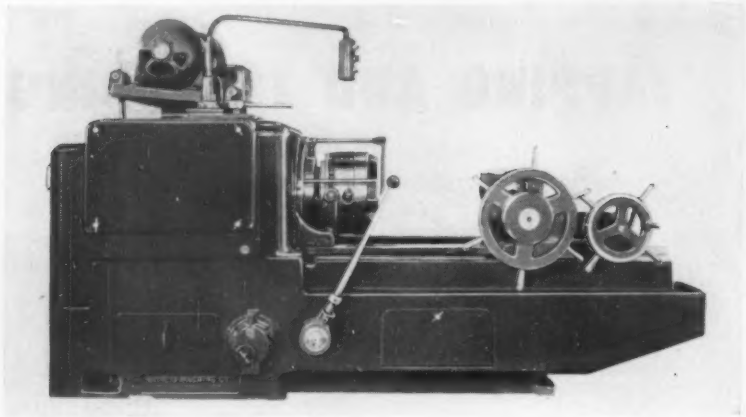
TAPPING UNIT—*Ettco Tool Co, Inc, 594 Johnson Ave, Brooklyn 37, NY.* Enables tapping of two or more small holes (of different tap sizes or pitches) on any drillpress. Consists of reversing head, three-spindle head, and fixture.



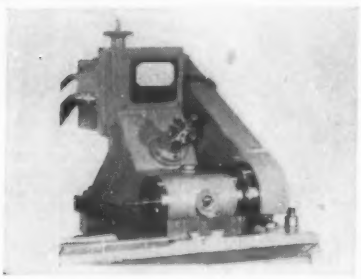
TAPPING ATTACHMENT — *Homestrand, Inc, Larchmont, NY.* Equipped with quick-change chuck. When tapping, tap rotates at spindle speed; when reversed, it retracts at double speed. Sleeve is graduated for setting required torque. Tap holders vary from 5/32 to 9/16 in. Swedish.



MULTI-PURPOSE TAPHEAD — *Landis Machine Co, Waynesboro, Pa.* Adapted for boring, counterboring, facing, and tapping with one chucking. Leadscrew feed is recommended for both boring and tapping operations.



THREADING MACHINE—*Landis Machine Co, Waynesboro, Pa.* Cuts bolt threads from 1½ to 6⅝ in. in dia, pipe threads from 1 to 6 in. in dia; lengths to 29 in. with leadscrew, 30 in. without leadscrew; pitch capacity ranges from 2 to 24 tpi. Three pairs of speed-change gears provide 12 spindle speeds from 9 to 152 rpm.



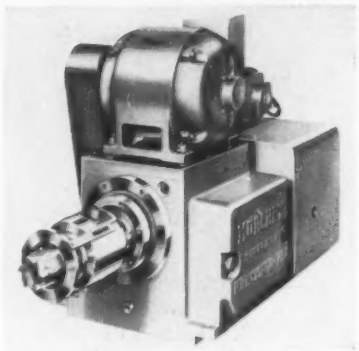
THREAD MILLERS — *Hanson-Whitney Div, Whitney Chain Co, Hartford, Conn.* Hydraulic head is said to absorb and distribute vibration. Speeds are infinitely variable up to 3000 rpm. Feeds are from 6 sec to 1 min per rev. Rapid-traverse time is 4 sec. Sizes are 4x9, 10x24, 15x30, and 20x48 in.

LEADSCREW — *Automatic Methods, Inc, 963 W Grand St, Div 16, Elizabeth, NJ.* Increases range of Auto-tap leadscrew tapping attachments from 5/16 to ⅝ in. Dia is 1 in. with variety of pitches.

PIPE-THREADING MACHINE — *The Oster Manufacturing Co, 2057 E 61st Pl, Cleveland 3, Ohio.* Standard range is 1 to 4 in.; four spindle speeds are controlled by lever. Designed for quick-changeover of pipe size.

→

THREAD GRINDER—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Spindle box and grinding table are adjustable to provide max range of 40° to create the pitch angle. Wheel dia is 13.8 in. but smaller wheels can be used for internal-thread grinding. Standard machine does single and multi-profile grinding; plunge grinding is accomplished by using lead collet while leadscrew is inoperative. German—Lindner.

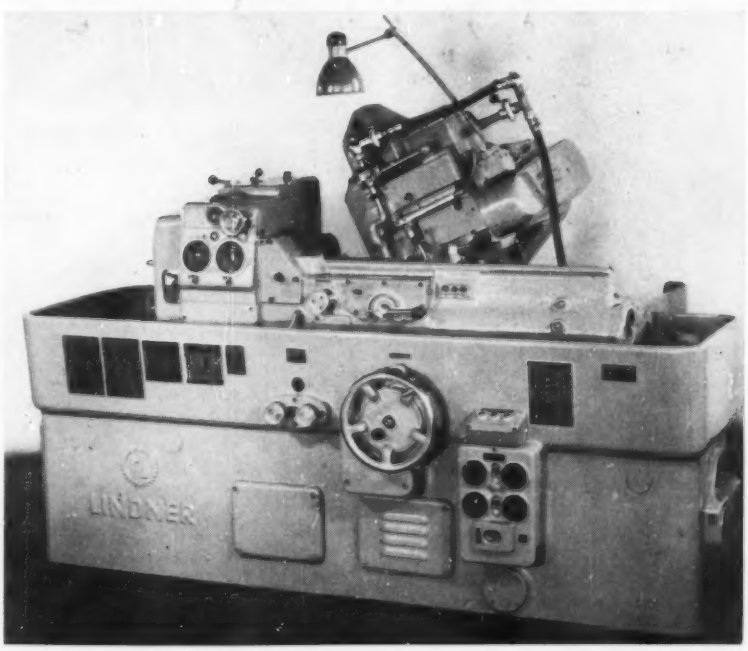


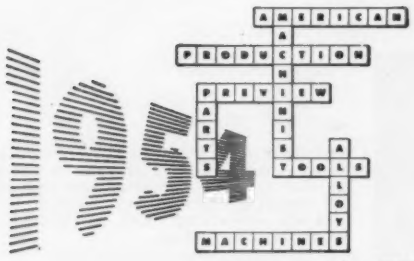
THREADING UNIT — *The Sheffield Corp, Dayton 1, Ohio.* Fully automatic; direct precision lead; rapid return of tool spindle; variable speeds. Precision-Pak.

BEADING MACHINE — *Steiner Machine Co, 1014 Washington St, Hoboken, NJ.* Four-spindle machine for thread-rolling and contour-shaping operations. Capacity is 5-in-dia work; uses standard forming tools.

THREAD ROLLING DEVICE—*Salvo Tool & Engineering Co, Roseville, Mich.* Models A and B for automatic screw machines of 1¼-in. capacity or more; model C for machines of 9/16- and 1-in. capacity. Model has choice of 27 pitch thread rolls; model B, 18; model C, 17.

PIPE PROCESSOR — *Quijada Tool Div, Gaines-Collins, 5474 Alhambra Ave, Los Angeles 32, Calif.* Automatic chuck threads, reams, and cuts 4-in. pipe in 44 sec. Standard unit handles sizes of 2½, 3, 3½ and 4 in.; adapters enable handling of ½ to 2 in. Eight hobbed jaws; eight speeds forward, four speeds reverse. Thred-O-Matic 44.

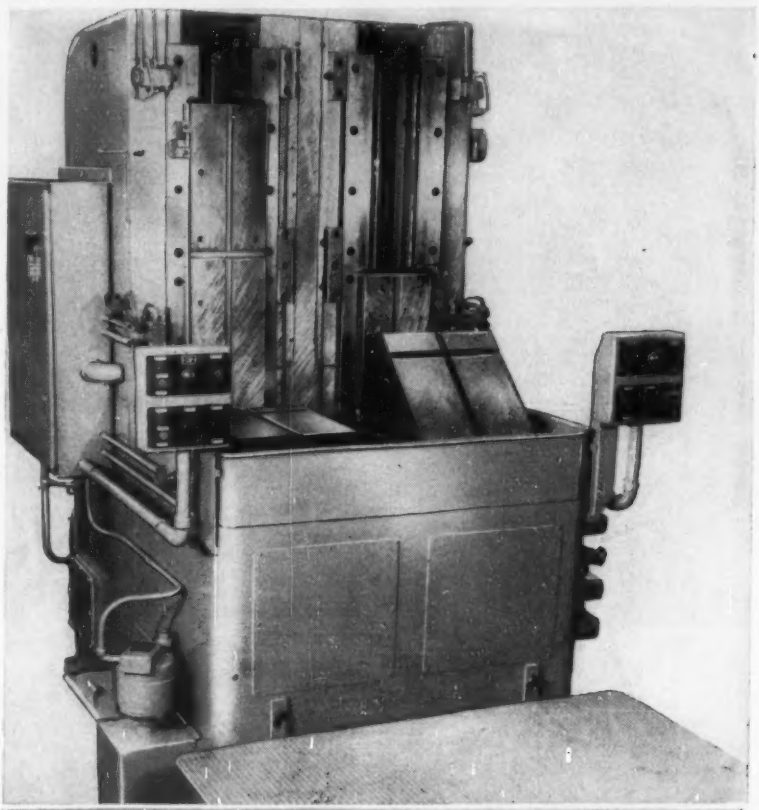




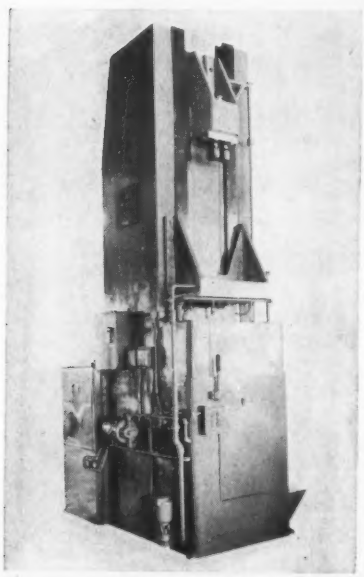
BROACHING

summarized from descriptions published during 1953

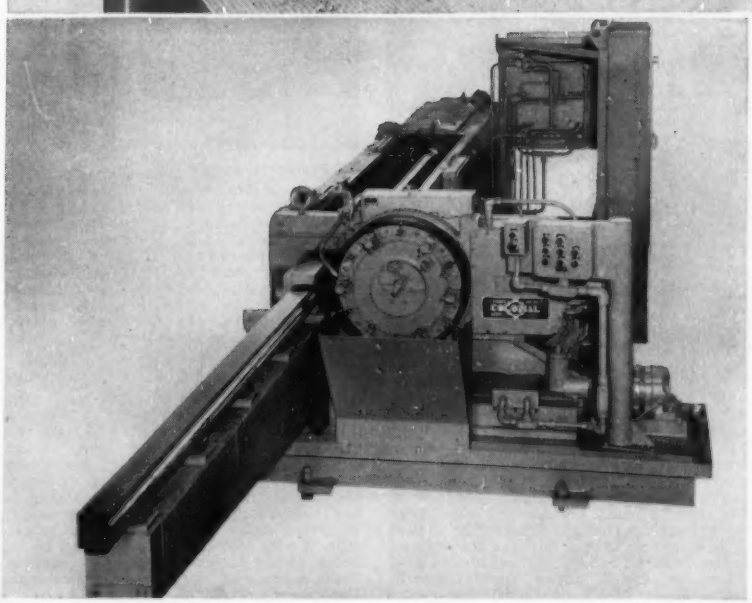
SURFACE BROACHING MACHINE—*American Broach and Machine Co, Ann Arbor, Mich.* For handling small parts at high production rate; automatic or semi-automatic cycle. Capacity is 4 tons; stroke is 30 in. Model SBD-30-4.



TRAVELING BROACH RACK—*Colonial Broach Co, Box 37, Harper Station, Detroit 13, Mich.* Employs small crane and hoist for lifting broaches. Shuttle rack, roller-mounted, is connected to broach ram and moves with it. When broaching pass is finished, rack is immediately above broach to be removed.

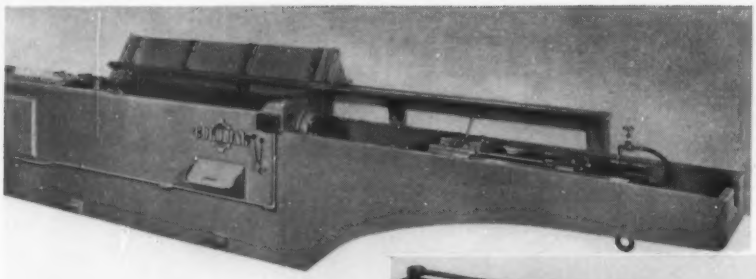


INTERNAL BROACHING MACHINES—*Acme Broach Corp, Milan, Mich.* Sizes from 6-ton, 36-in. stroke, to 30-ton, 60-in. stroke. Large parts may be broached with single broach or two or four smaller parts may be broached simultaneously. Cutting speed and stroke are adjustable. Machines are hydraulic, internal pull-up type.



HORIZONTAL BROACH — *Colonial Broach Co, PO Box 37, Harper Station, Detroit 13, Mich.* For automatic broaching of external slots or scallops on jet-engine rings. Basic machine is standard 10-ton 60-in. stroke and 10-ton 90-in. stroke model. Shuttle movement and indexing are hydraulically driven.

BROACHING



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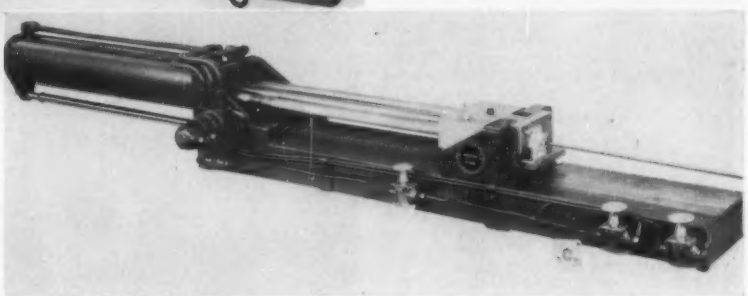
BROACH CARRIER RACK—*Colonial Broach Co, Box 37, Harper Station, Detroit 13, Mich.* Travels with ram of horizontal machine to save time on operations requiring use of multiple broaches in sequence.



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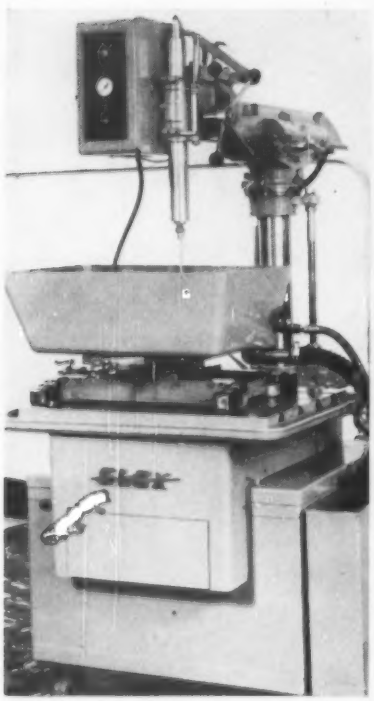
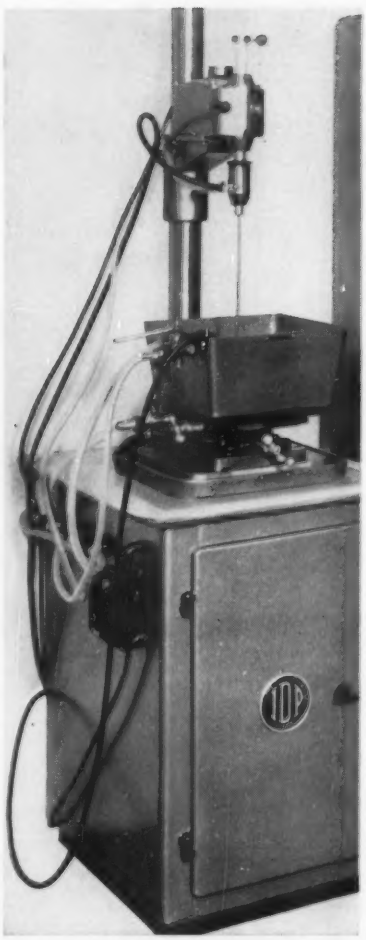
BROACHING FIXTURE — *National Broach & Machine Co, 5600 St Jean, Detroit 13, Mich.* Air-powered; broaches holes, keyways, and contours with 1400-lb pull capacity on 80-psi airline pressure. Cycle time to rough and finish close-tolerance valve spool hole broach in tractor part is 15 sec.

ELECTRIC-ARC MACHINING



ELECTRICAL DISCHARGE MACHINE—*Elox Corporation of America, 740 N Rochester Rd, Clawson, Mich.* Improvement on earlier model has high-frequency power supply and automatic feed arrangement. Control of the length and volume of discharge with high-frequency reportedly makes it possible to attain surface finishes of from 50 to 80 mu-in. Attachments give 10-mu-in. finish under special conditions. Model M-400.

DISINTEGRATOR—*Metalmaster Div, Clinton Machine Co, Clinton, Mich.* Hand model (for standard drillpress), medium, and large units have redesigned cutting head. Machines remove broken taps, produce holes of any shape, and cause as little as 0.002 in. overburn with some electrodes. Head swings 360° in vertical plane; cross-arm swings 360° in horizontal plane. Electrode cycles 3600 times a minute.



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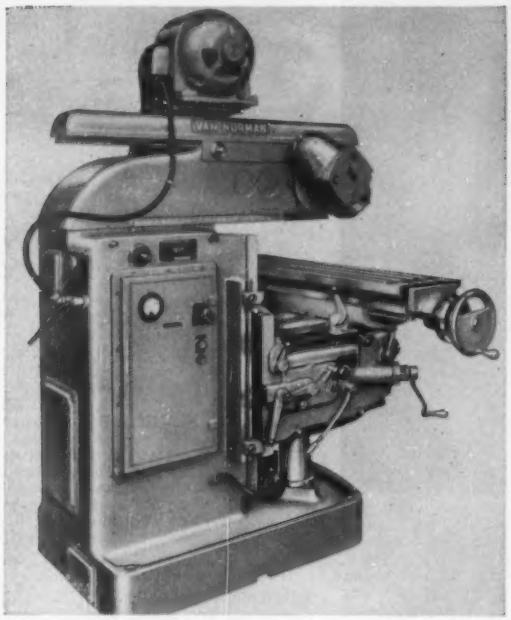
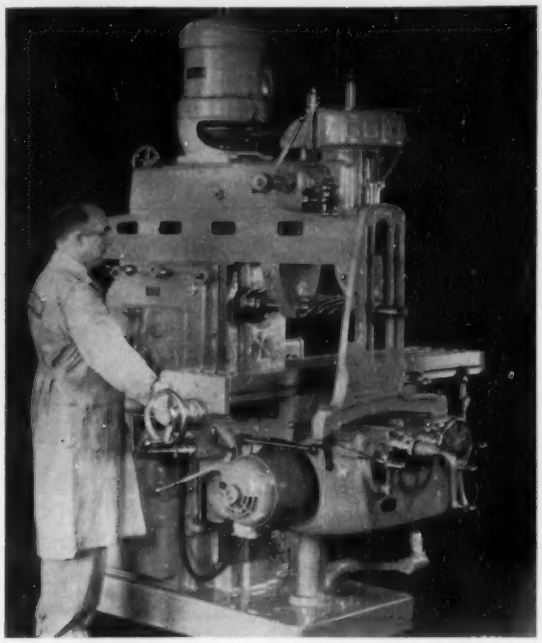
SPARK-MACHINING UNIT — *Wickman Manufacturing Co, 10325 Capital Ave, Detroit 37, Mich.* Consists of electric control cabinet and servo-controlled electrode holder; machines carbides, cermets, and other difficult-to-machine metals. Speed of cutting is controlled and may be varied for rough or finish cuts. Finish of 25 rms is obtained with slow cut but is said to be more easily lapped to precise surface than machined surface of same rms. British—Sparcatron, Ltd.

1954 MILLING

summarized from descriptions published during 1953

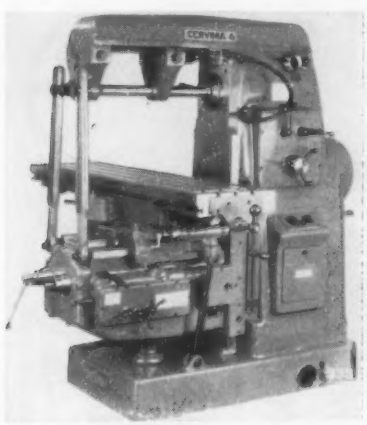


RAM-TYPE MILLERS—*The Van Norman Co, Springfield, Mass.* Adjustable cutterhead permits horizontal, vertical, and angular milling. Features: heavier base and column, larger table, saddle and knee assembly with feed motor mounted on side of knee, and heavier rams with greater ram movement.

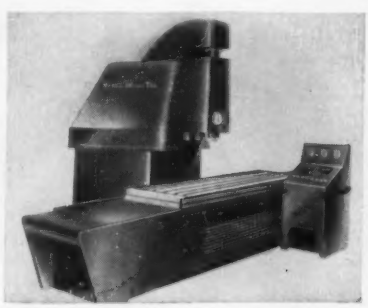


DUAL MILLING MACHINES—*George Gorton Machine Co, Racine, Wis.* Basic horizontal millers feature fullwidth knee, rigidity for plain and universal milling, and interchangeable components. Machines can be equipped with receptor ram and vertical milling head which extends or retracts into ram. This allows face and slab milling or high-speed vertical milling, die and mold duplicating, and profiling. Machines feature three ranges of speeds and feeds.

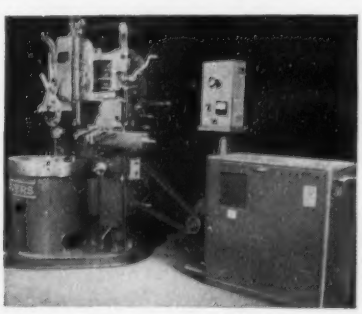
VERTICAL MILLING MACHINE — *Clausing Div, Atlas Press Co, Kalamazoo, Mich.* For handling small die work, jig and fixture making, and model making. Spindle head can be set at any angle from vertical to horizontal; spindle can be rotated 360° in horizontal plane on turret axis. Transverse travel is 5 in.; max distance between spindle and table, 12 in.



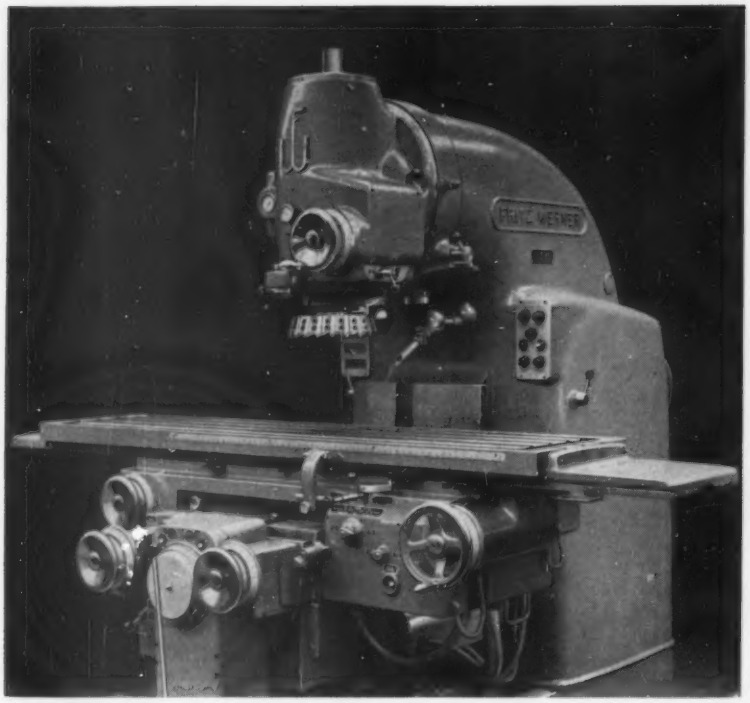
MILLING MACHINE—*Misal Machinery Inc, 1 East 53rd St, New York, NY.* Adjustable knee and column distribute heavy work load. 20 speeds and 24 feeds; power rapid traverse is 60 ipm; spindle is rated at 8 hp. Simplified gear train is said to assure uniform delivery of power to spindle. No. 4. Italian—Cervinia.



VERTICAL MILLER—*De Witt Lewis Co, 3629 Sophia St, Wayne, Mich.* Tracing, profiling, and milling machine said to be capable of hydraulic tracing accurate to 0.001 in., electronic tracing accurate to 0.0002 in. Air-hydradyne jacks automatically maintain level of table.



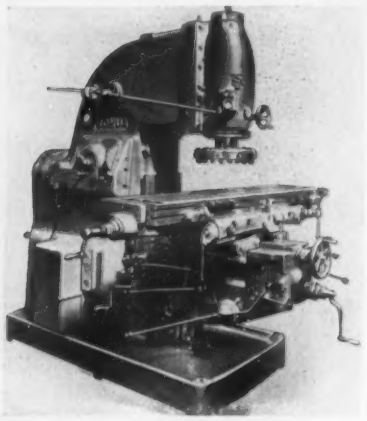
ADJUSTABLE SPEED DRIVE — *Rogers Machine Works, 1400 Seneca St, Buffalo 10, NY.* For Rogers vertical turret mill; provides table chuck speeds to 212 rpm. Eliminates 8-speed transmission, clutch, brake, and lever controls on standard model.



MILLERS—*Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, NY.* Plain, universal, and vertical precision milling machines have sliding column support for front end of knee. Twelve spindle speeds range from 40 to 900 rpm. Longitudinal and cross feeds range from 0.47 to 16.93 ipm, vertical from 0.23 to 8.46 ipm. Table travel is 32 in. longitudinally, 9 in. cross, and 17 in. vertically. Denmark—Hercules.

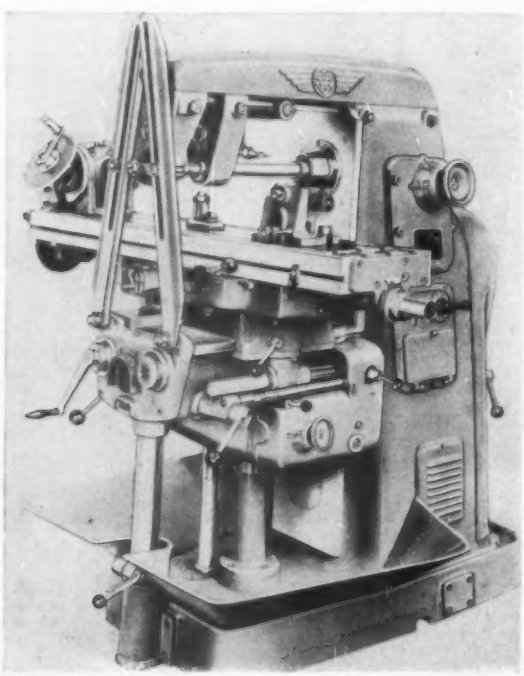
MILLING MACHINE—*Marac Machinery Corp, 1819 Broadway, NY 23, NY.* Preselection of 42 speeds and 50 feeds. Speeds range from 16 to 1800 rpm and feeds from 3/16 to 80 ipm. Speed changes are accomplished by solenoid valves operating hydraulic cylinders to shift gear clusters. All three table motions are controlled by electro-hydraulic clamps. German—Fritz-Werner.

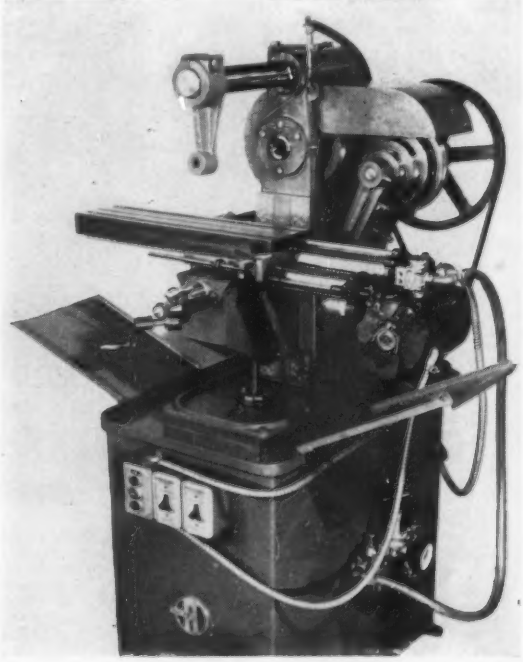
VERTICAL MILLER—*American Machinery Co, 3136 E Olympic Blvd, Los Angeles 23, Calif.* Reportedly does straight-, angle-, and radius-cutting, boring, and drilling without changing setup. Spindle speed is up to 4100 rpm; cross travel 10 in., longitudinal 24 in., vertical 18 in., and overarm 10 in.

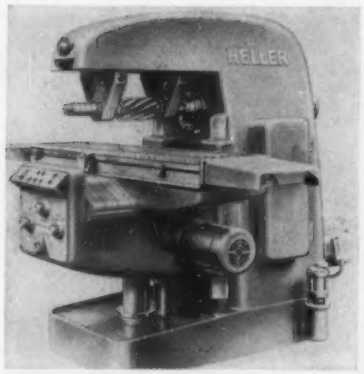


MILLING MACHINES—*Morey Machinery Co, 410 Broome St, New York, NY.* Universal, plain, or automatic models; automatic-cycle table control; feed drive through bevel gears. Includes hydraulic speed-change selector, mechanical feed-change selector, and independent automatic feeds. French—Somua.

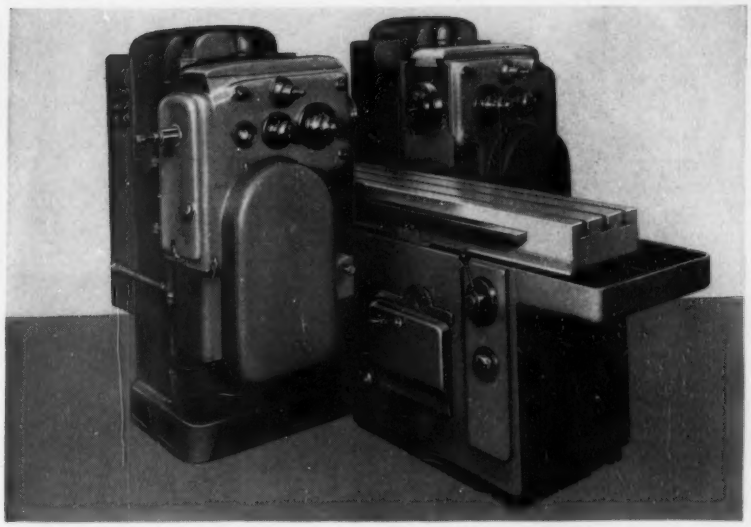
PRODUCTION MILL—*Rotex Punch Company, Inc, 2350 Alvarado, San Leandro, Calif.* Features rapid approach, infinitely adjustable cutting speeds, and automatic return; said to be in price range of many bench mills. Tables have 2 or 3 slots milled from solid.







MILLING MACHINES — *Heller Machine Co, 114 Liberty St, NY 6, NY.* Several combinations of automatic control: preselector cycling, full automatic cycling, and electro-hydraulic feeler control. Feed is hydro-mechanical, variable from ¾ to 40 ipm longitudinally and cross, and 3/16 to 10 ipm vertically. Model FH140, horizontal, has 20 to 30 hp; model FV140, vertical, has 20 to 40 hp. German—Heller.

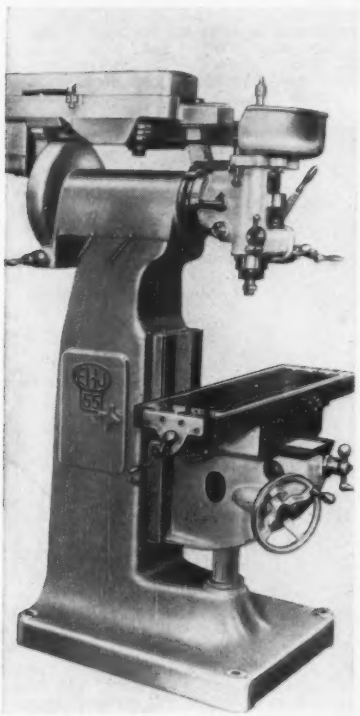


AUTOMATIC MILLING MACHINES —*The Cincinnati Milling Machine Co, Cincinnati 9, Ohio.* Plain, duplex, and plain rise-and-fall with table travel of 24 in., rapid traverse at 300 ipm, and spindle speed from 30 to 1200 rpm. Single lever initiates complete milling operation, but all automatic features can be bypassed for manual control. Sequence of automatic functions is controlled by assembly of cams. Extra equipment includes spindle speeds 60 to 2400 rpm, table feeds to 80 ipm.

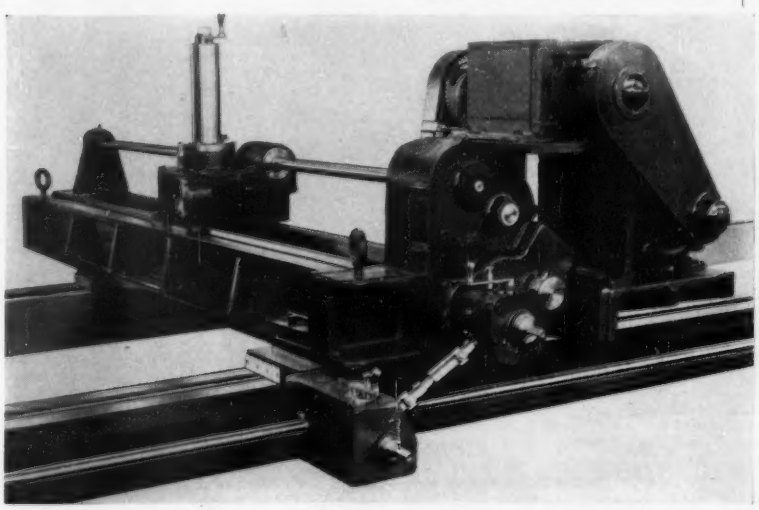
VERTICAL MILLER—*Duff Machine & Die Co, 31 Wingate St, Haverhill, Mass.* Redesign features speed range of 300 to 3200 rpm and collet capacity of ½ in. Max distance of spindle to table is 15 in. Longitudinal feed is 15 in.; crossfeed, 8 in.

MILLING MACHINE—*Morey Machinery Co, Inc, 41 Broome St, New York, NY.* Redesigned unit has 39½x9¼-in. table. 12 spindle speeds; 6 table feeds. Hero.

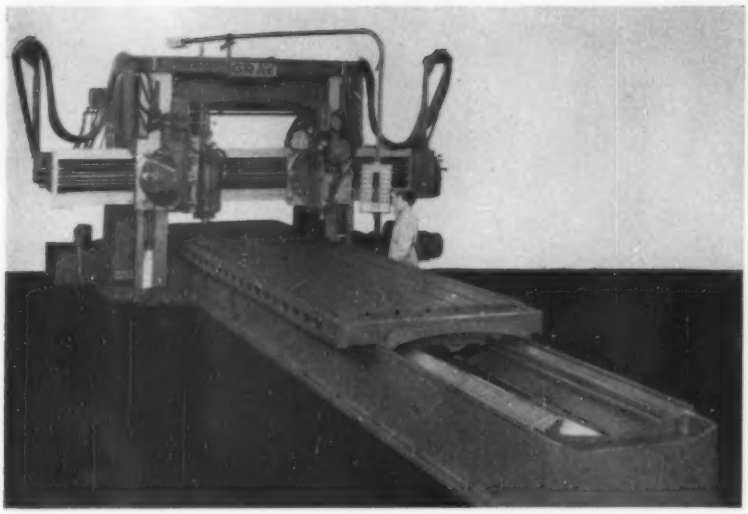
MILLING AND FACING MACHINE—*Forney's, Inc, Box 310, New Castle, Pa.* For surfaces up to 84 in. wide. Spindle speed range is 9 to 72 rpm; cutters are 3 to 15 in. in dia.



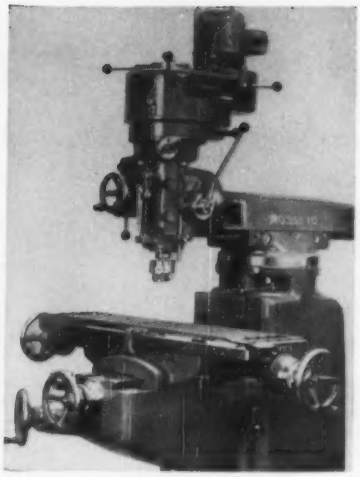
VERTICAL MILLING MACHINE — *British Industries Corp, International Machinery Div, 164 Duane St, New York 13, NY.* For high-speed milling and die-sinking. Head swivels 90° in either direction. Collet capacity is ⅝ in. Eight speeds vary from 125 to 2960 rpm. British—E H Jones.



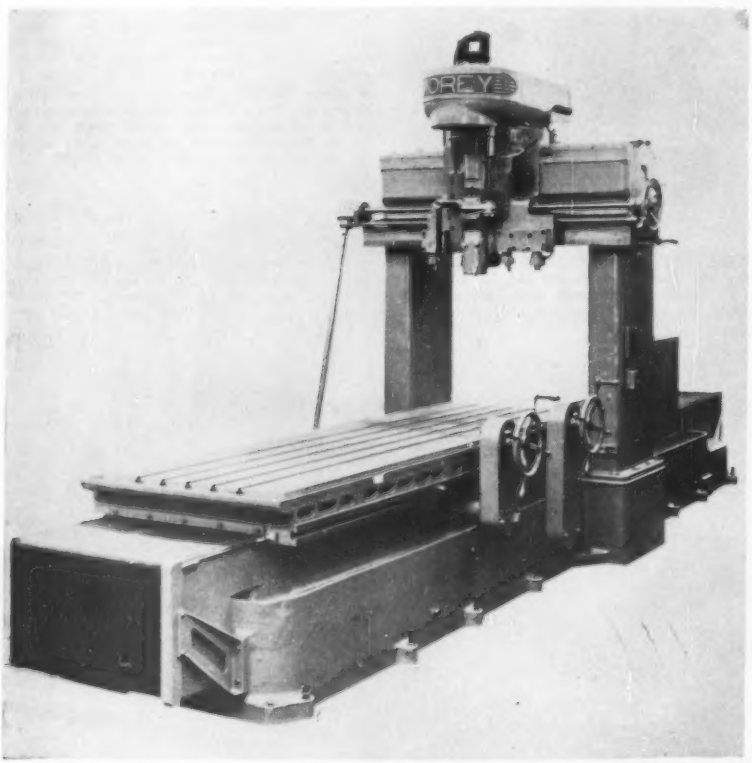
SPACING COLLARS—*Dayton Rogers Manufacturing Co, Minneapolis, Minn.* Micrometer-adjustable for milling-machine cutter arbors. Arbor can be tightened to 20-ton pressure without disturbing accuracy.



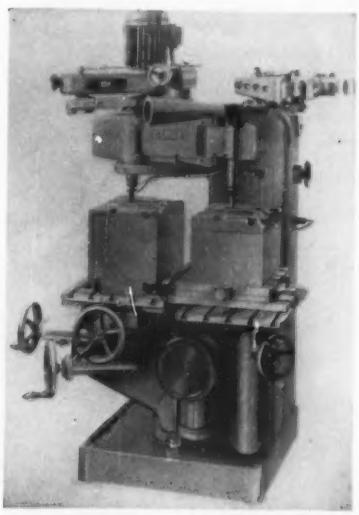
SKIN MILLING MACHINES—*The G A Gray Co, 3611 Woodburn Ave, Cincinnati 7, Ohio.* Mill aircraft wings and other structural sections from solid aluminum plates up to 4 in. thick. Specifications on one machine are: table travel of 24 ft, work height max of 42 in, width of 84 in. between uprights. Both railheads swivel 20° either side of vertical and left railhead swivels 15° forward or back. Provision is made for securing full-size templets to the machine. Large aluminum plates are secured by vacuum chucks.



VERTICAL MILLER — *Amitool Co, Sylvester St, Westbury, NY.* Eight-speed head revolves 360° on horizontal axis and may be tilted 180° from vertical axis. Longitudinal travel is 26 in.; cross travel, 10 in.; vertical movement of knee, 20 in. Dials are graduated to 0.001 in. Italian—Rossi.

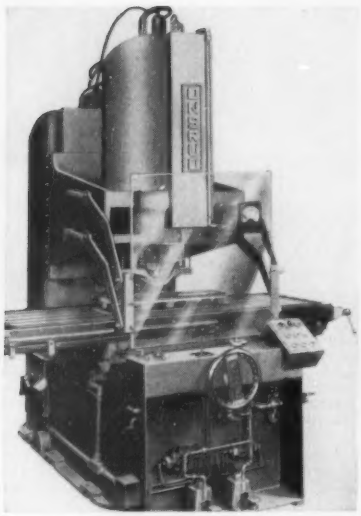


MILLING MACHINE—*Morey Machinery Co, Inc, 410 Broome St, New York 13, NY.* Larger model Aero-frame profiler and milling machine for such parts as aluminum and magnesium airframes, as well as cast iron parts and steel forgings. Table has 10-ft length; spindle-speed range is 125 to 4600 rpm.

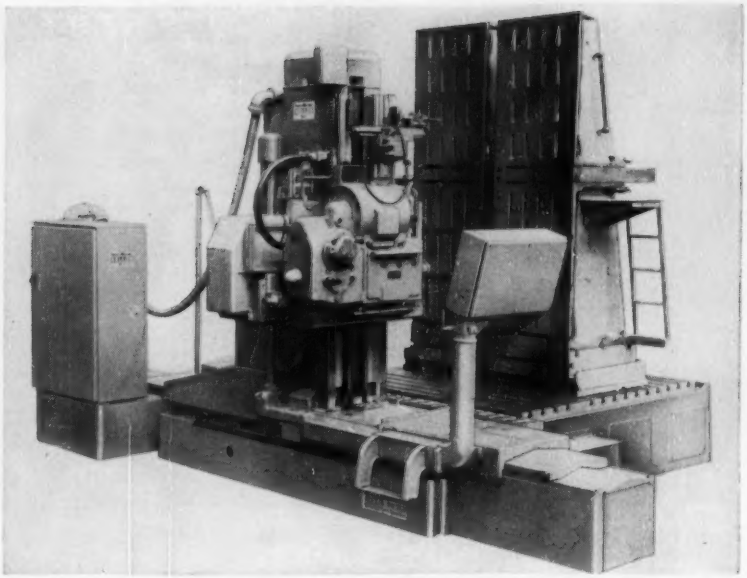


DIE-SINKING MACHINE—*Cosa Corp, 405 Lexington Ave, New York, NY.* Pantograph system permits two- or three-dimensional milling at 1 to 1 ratio and reductions or enlargements from 1:1.5 to 1:4. Infinitely variable spindle speeds range from 60 to 10,000 rpm. In one setup, tool will cover area of 15¾x15¾ or 10x19¾. Model KF12.

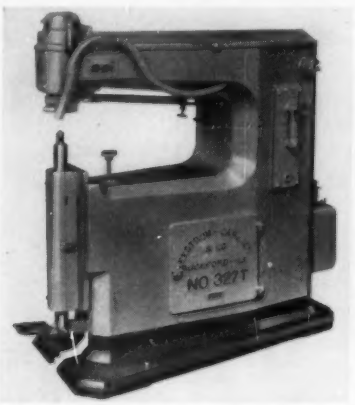
MILLING AND ROUTING MACHINE —*Turchan Follower Machine Co, 8259 Livernois, Detroit 4, Mich.* Three-dimensional tracer control allows fingertip operation through hydraulic tracer servo control. Feed rate, 0 to 65 ipm; spindle speeds, 900 to 3600 rpm.



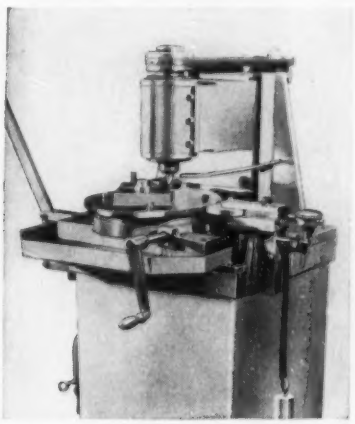
PROFILE MILLER—*Onsrud Machine Works, Inc, 3921 Palmer St, Chicago 47, Ill.* Coordinated tri-directional feed is said to make it possible to mill any profile without slowing feed. Rotary power feed of cutterhead is automatically combined with transverse and longitudinal table power feed. Max feed is 12 in. transversely and 42 or 60 in. longitudinally. Model A-42.



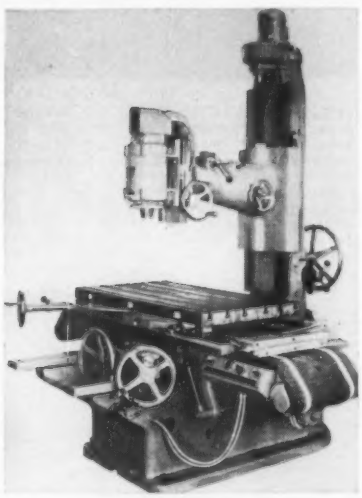
TRACER-CONTROLLED MILLER — *Pratt & Whitney, Division Niles-Bement-Pond Co, West Hartford 1, Conn.* Electrically controlled miller allows tracing from sheet-metal templet or using three-dimensional tracer. Five models range from 2½x4 ft to 4x10 ft. Keller BG-21.



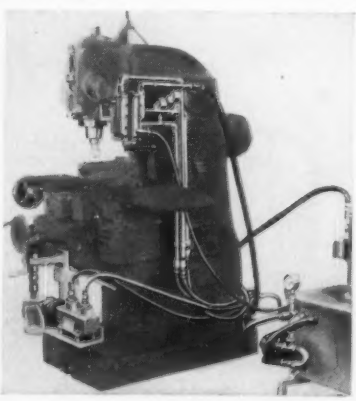
TRIM ROUTER—*Ekstrom, Carlson & Co, Dept M-1, 1400 Railroad Ave, Rockford, Ill.* For large and difficult-to-handle non-ferrous sections. Spindle speeds are 10,000 and 20,000 rpm; throat clearance is 27¾ in.; max stroke 6¼ in. Model 327-T.



CAM PROFILE MILL—*Spike Manufacturing Co, 2469 Middlebelt Rd, Farmington, Mich.* Said to reduce eleven conventional milling operations to two. Set up for various jobs by changing cams made to max capacity of machine.



MILLING MACHINE—*Kurt Orban Co, Inc, 205 E 42nd St, NY 17, NY.* Handles work to 8½-ft dia; table has 28-in. traverse and 48-in. longitudinal movement. Unit can be used as radial drill. Model 2. German—Bokoe.

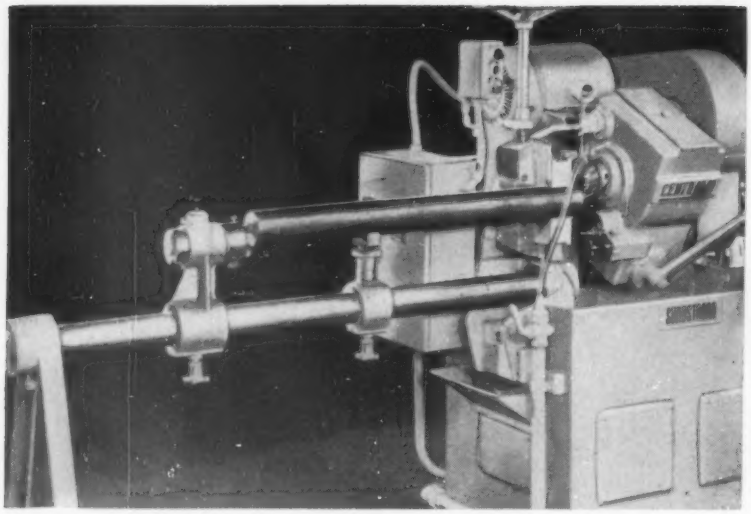


DIESINKING MACHINE—*Rene Boas and Associates, 92 Liberty St, New York 6, NY.* Milling machine for reproducing from templet dies obtains reduction from master by vertical pantograph. Reduction can range from 1:1.5 to 1:4; stepped pulleys permit spindle speeds from 270 to 6400 rpm. Type FK/2a. German—Kampf.

→

COPYING MACHINE—*Morey Machinery Co, 410 Broome St, NY, NY.* For attachment to millers to permit machining of complex shapes. Capable of both small and large runs; obtainable in several sizes.

ENGRAVING MACHINE—*J Arthur Deakin & Son, 150-28 Hillside Ave, Jamaica 2, NY.* Pantograph of 2-spindle machine transfers engraving movement from one master to two copying spindles. Spindles can be adjusted individually to equalize depth of cut.



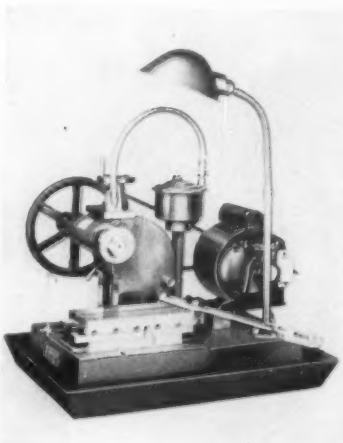
MILLING AND CENTERING MACHINE—*Sunstrand Machine Tool Co, Rockford, Ill.* Handles work from ¾ to 3½ in. in dia and 5 to 48 in. long. Rocker milling head mills one end which is then manually centered and reversed for working other end. Sunstrand No. 0.

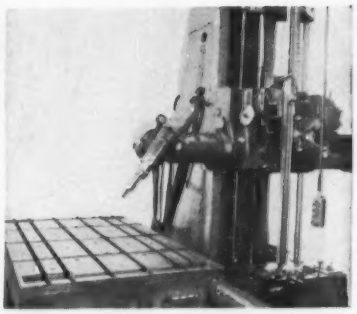
MILL HEAD—*Rusnok Tool Work, 4840 W North Ave, Chicago 39, Ill.* Now made with 1-hp motor with capacity to ¾-in. end mill in steel. Standard ¼ and ½ hp still available.

→

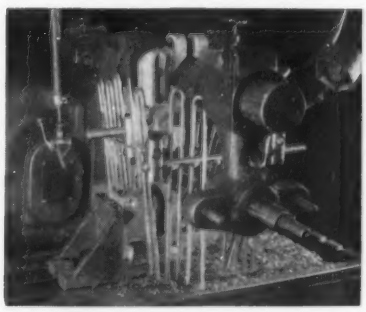
BENCH MILL — *Viking Industries, Rockford, Ill.* For cutting keyways, slotting, splitting, cutting at different angles, and similar jobs. Wide speed range to 7000 rpm; single-slide table has 4-in. travel. Base dimensions are 11x18 in.

BALANCE-ADJUSTMENT MILLER—*Taylor Dynamometer & Machine Co, Milwaukee, Wis.* Consists of milling attachment mounted on worktable with coolant trough. Designed for use with Hi-Eff balancing machines.

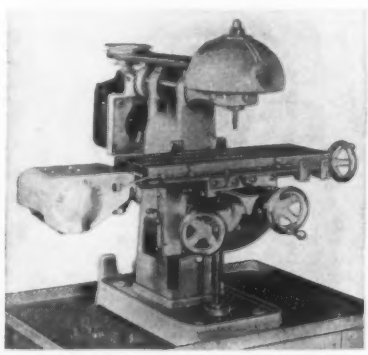




MILLING ATTACHMENT — *Giddings & Lewis Machine Tool Co, Fond Du Lac, Wis.* For use on G&L table-type horizontal boring, milling, and drilling machine to machine aluminum alloy forgings for airplane wing hinge sections. Attachment is independently driven—has no connection with machine spindle. Swivels 360° vertically and horizontally. Spindle speed is from 800 to 2400 rpm.



MILLING MACHINE GUARD—*Searjeant Metal Products, 77 Pittsford Rd, Mendon, NY.* For all production mills. Consists of vertical hexagon rods forming a barrier around three sides of rotating cutters. Device contracts or expands; each rod is locked in place by a thumbscrew.

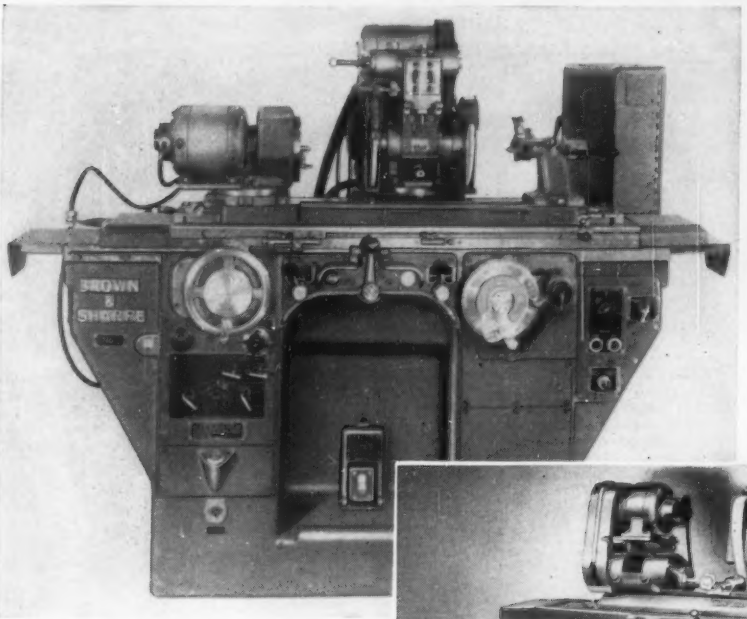


POWER FEED ACCESSORY—*Benchmaster Manufacturing Co, 1835 W Rosecrans Ave, Gardena, Calif.* For use on Benchmaster handscrew mills. Unit is driven by electric motor to permit table operation totally independent of spindle speed. Power developed exceeds milling capacity of machine. Automatic stops are adjustable. Price: $125.

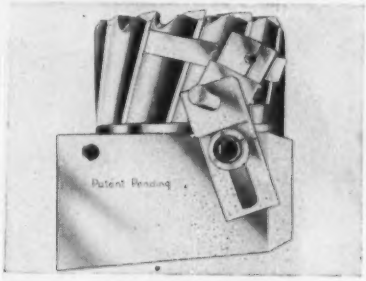
1954 AMERICAN PRODUCTION PREVIEW — MACHINES & TOOLS

GRINDING, HONING, LAPPING

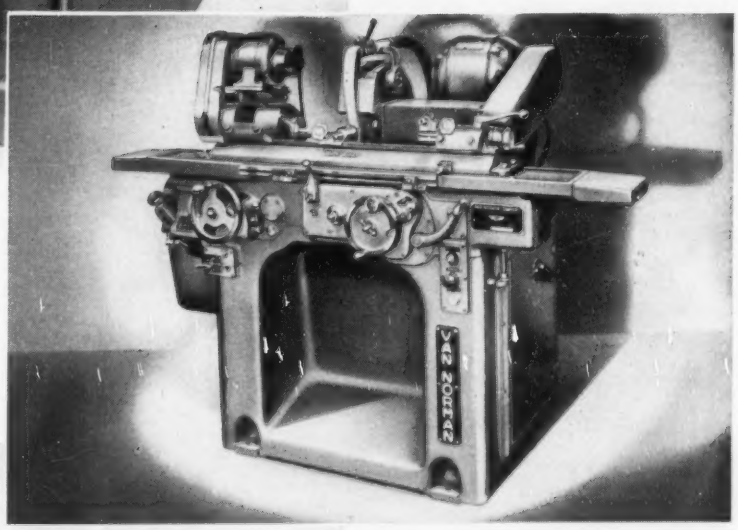
summarized from descriptions published during 1953



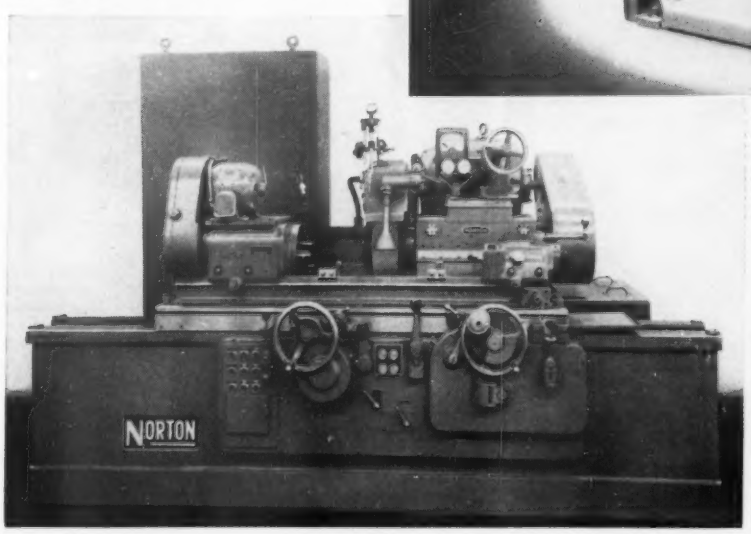
UNIVERSAL GRINDER — *Brown & Sharpe Mfg Co, Providence, RI.* External and internal spindles usable in any horizontal position or in compound settings for combination straight and taper or double-taper grinding. Crossfeed adjustable to 0.0001 in. on work diameter for accurate sizing. Positive stops on crossfeed for either external or internal grinding. Four models have distances between centers of 22¾, 33¾, 43¾, and 63¾ in. Table power travel from 3 to 150 ipm. JIC electrical and hydraulic standards.



GRINDER ATTACHMENT—*Westcott Chuck Co, Oneida, NY.* Attachment to surface grinder sharpens teeth of shell mills, side-milling cutters, and inserted-tooth milling cutters. Work lies in vertical position.



CYLINDRICAL GRINDER—*The Van Norman Co, Springfield, Mass.* Precision traverse for plunge cylindrical grinding of small parts on production basis. Wheel speeds are 1772 and 2067 rpm; headstock speed 153 to 940 rpm; max dia 4 in.; distance between centers 18 in. max. Model 418.



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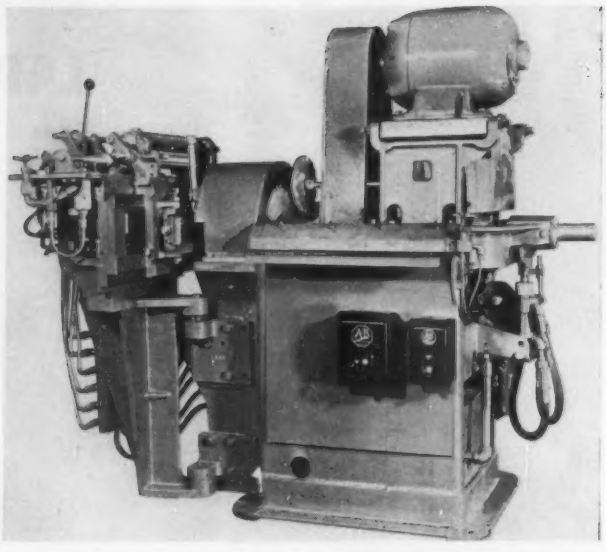
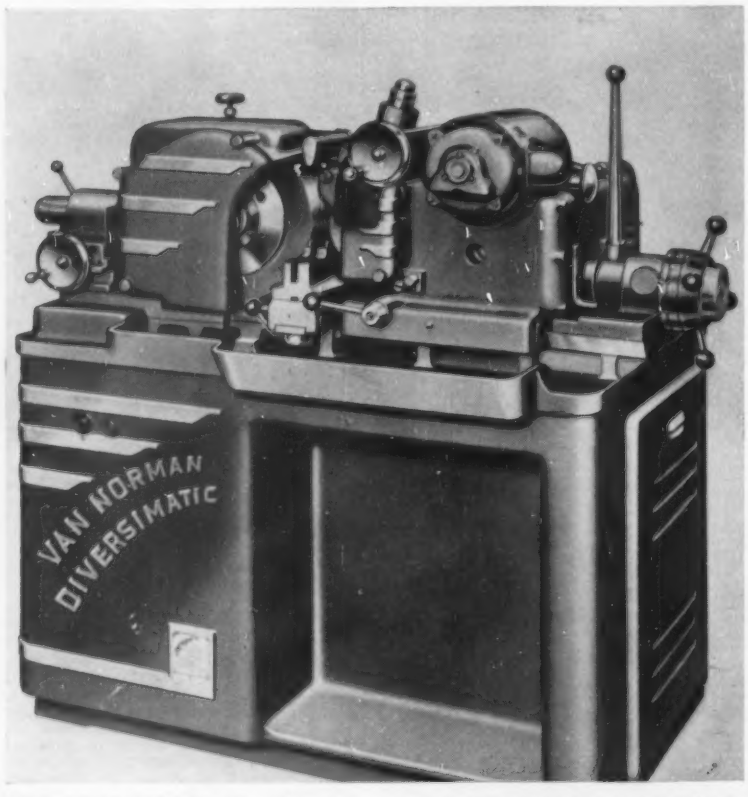
CYLINDRICAL GRINDER — *Norton Co, Worcester 6, Mass.* Available in plain or semi-automatic models with 10- or 14-in. capacities, machines are for plunge-cut and traverse grinding operations that require large-diameter or wider grinding wheels. Provides preset truing and grinding table speed arrangement. Takes wheels up to 10 in. wide. Lengths are 18, 36, 48, or 72 in. Model CTU-HD (10 in.) and LCTU-HD (14 in.).

SURFACE GRINDERS — *Standard Electrical Tool Co, 2480 W Sixth St, Cincinnati 4, Ohio.* Line now includes sizes of 10, 12, 14, 16, and 18 in. Machines are hydraulically and electrically controlled. Graduated handwheel provides independent vertical adjustment.

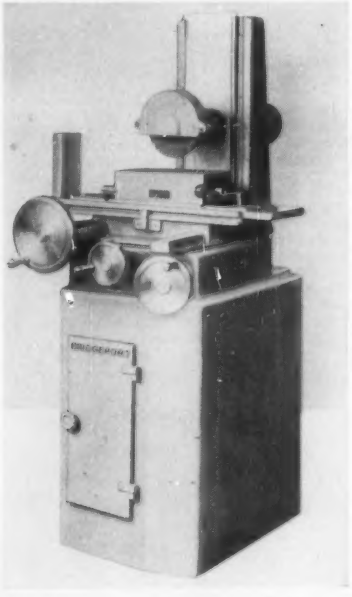


REMOTE CONTROL SYSTEM—*Teleflex, Inc, North Wales, Pa.* For production hydraulic universal grinders; groups eight controls at front of machine. Each original knob is replaced by a small hobbed wheel with which is meshed a spiral-clad cable.

UNIVERSAL GRINDER — *Nicholas Equipment Co, Bellevue, Ohio.* Model A, for single-pass repeat grinding, has fixed hydraulic sequence. Model B, for multiple work, has variable hydraulic sequence. Wheel is 16x4x13½ in.



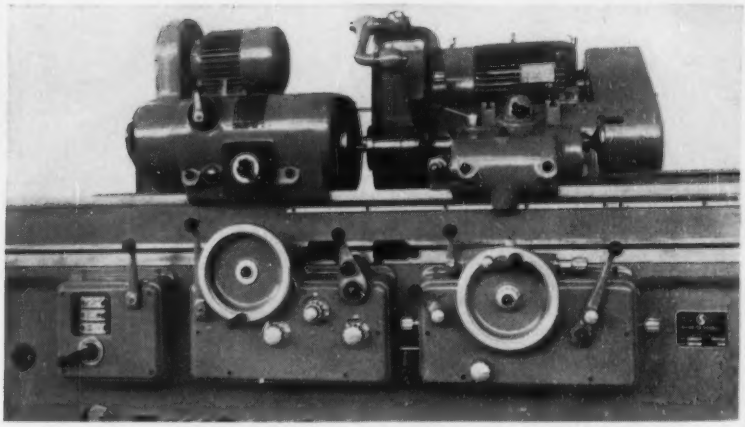
CENTERLESS GRINDER—*Van Norman Co, Springfield, Mass.* Handles small parts and formed parts of two or more contours. Crush-forming attachment dresses wheel face to desired contour. Grinding-wheel speed 1600 rpm; regulating-wheel speed variable from 30 to 300 rpm.



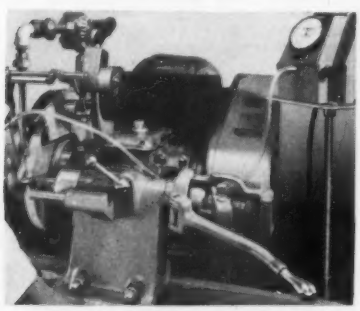
SURFACE GRINDER — *Bridgeport Grinding Machine Co, 315 Asylum St, Bridgeport, Conn.* Has 13-in. capacity under wheel which is 7x½x1¼ in. Spindle speed is 3500 rpm. Spindle is Pope, Excello, or Whiton.

SPINDLES—*Whitnon Manufacturing, New Britain, Conn.* For surface grinders; permit finishes of 2.5 to 4.0 mu-in. Spring preloading keeps wheel chatter-free under radial and axial loads.

GRINDING MACHINES—*Kelvin Systems Corp, 135 Front St, NY 5, NY.* Line includes centerless grinders, duplex grinders, surface grinders, and end-forming machine. Units have nitralloy spindles with built-in adjustment for wear. British—Scrivener.

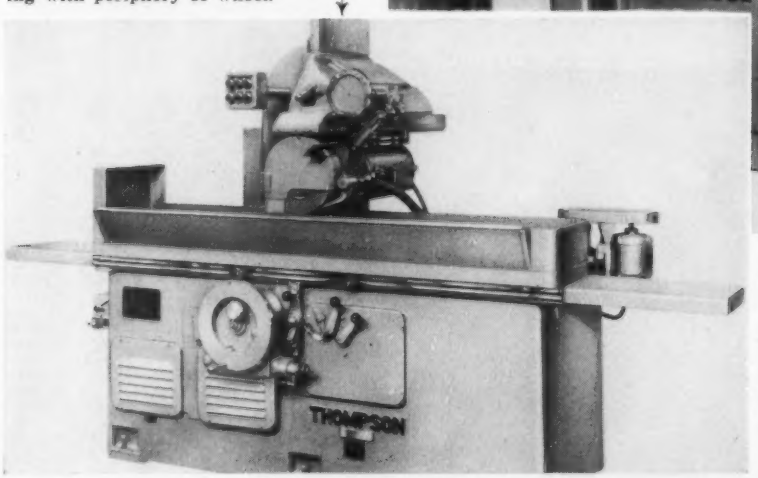


CYLINDRICAL GRINDERS—*Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, NY.* Five sizes have swing from 16 to 32 in. with center distances from 40 to 160 in. Work carriage can be traversed either manually or hydraulically with infinitely variable speeds to 12 fpm. Carriage reversal and grinding wheel feed are effected manually or automatically. Top can be swiveled for taper work, amount of taper set by vernier. German—Schmaltz.

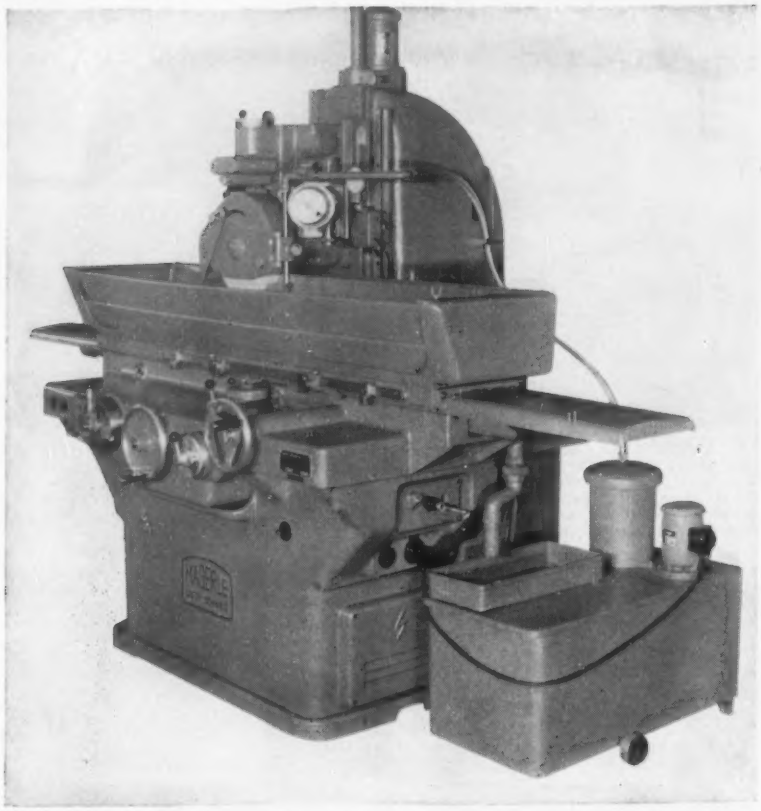


GRINDING GAGE—*Federal Products Corp, 114 Eddy St, Providence 1, RI.* Magnifying air attachment for close-tolerance cylindrical grinding. Said to give operator ample time to adjust rate of infeed as final size is approached. Model A-77.

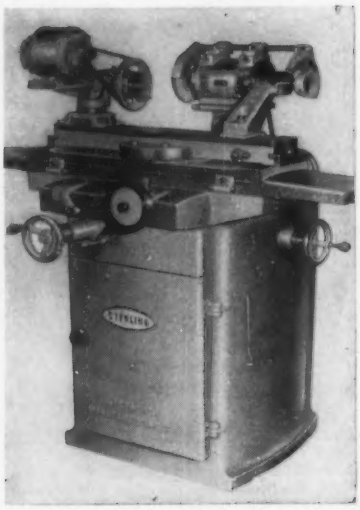
HYDRAULIC SURFACE GRINDER—*The Thompson Grinder Co, Springfield, Ohio.* 16 sizes range from 6x18 to 12x120 in. Incorporates crossfeeding wheelhead for horizontal spindle grinding with periphery of wheel.



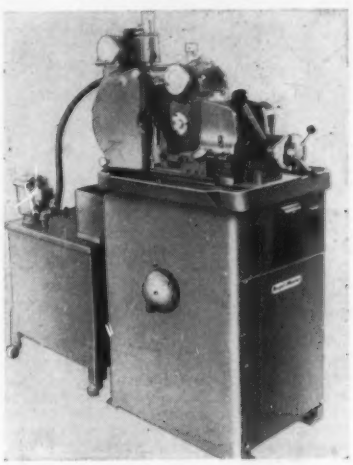
SURFACE GRINDER — *The DoAll Company, 254 N Laurel Ave, Des Plaines, Ill.* Designed to receive attachments that broaden scope of application. High-speed-spindle attachment belt, driven from grinder spindle, can be swung to vertical position for broach sharpening. Coolant system divides to provide choice of cool grinding, flood cooling, or combination. Low speed range is 400 to 4000 rpm; high speed range is 4000 to 16,000 or 5000 to 20,000 rpm.



SURFACE GRINDER — *Pellow Machine Co, 13500 Foley Ave, Detroit 27, Mich.* Said to offer exceptional quality and accuracy; completes repeated loadings of chuck automatically within 0.0002 in. Head feed is controlled by independent electric circuit or handwheel graduated to 0.0001 in. Table motions are hydraulically powered, longitudinally variable from 10 to 100 fpm. Wheel has 11½-in. dia, 1¼-in. width. Swiss—Magerle.



GRINDER — *McDonough Manufacturing Co, Eau Claire, Wis.* Direct-drive wheelhead with Excello spindles, rotates 360°; worktable swivels 180°. Swing over table is 10¾ in.; max distance between centers 27 in. Sterling model G.



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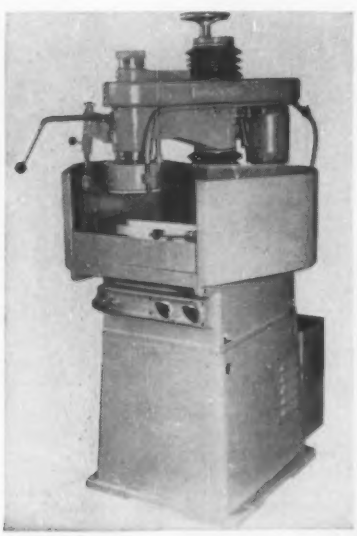
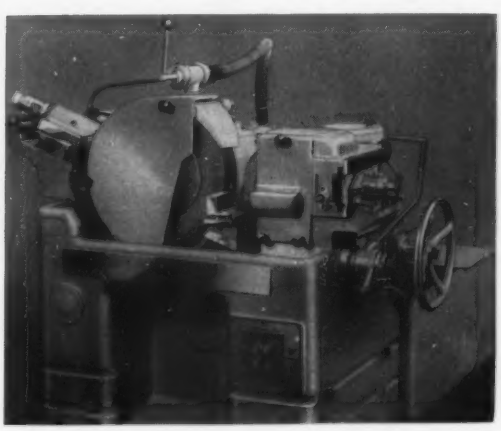
CENTERLESS GRINDER — *Royal Master Metal Products Co, State Highway 23, Riverdale, NJ.* For straight or contour work from 1/16- to 1-in. dia with tolerance held to 0.0003 in. Regulating wheel has infinitely variable-speed drive with range from 30 to 480 rpm.



SURFACE GRINDER—*George Scherr Co, Inc, 200 Lafayette St, New York 12, NY.* Uses vertical spindle and 7½-in.-dia cup wheel. Fine adjustment is by graduated drum reading in 0.0004-in. divisions. Equipped for wet grinding.



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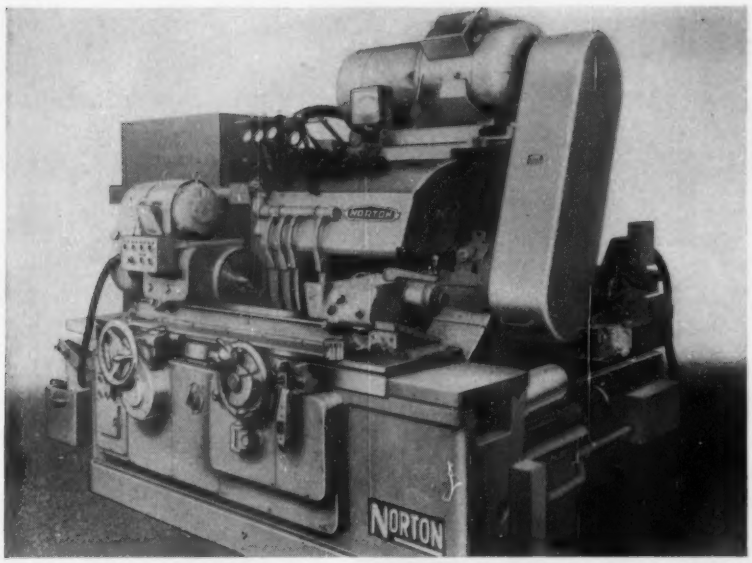
CENTERLESS GRINDING MACHINE — *Carney Stansfield Co, 270 E. Hamilton St, Allentown, Pa.* Work from 1/16 to 3 in. in dia can be ground by straight-through or plunge-cut methods. Features: swiveling control head, micrometer lateral spindle adjustment, separate truing slides for control and grinding wheel, and attachments which enable through-feed bar grinding from 1/16 to ¾ in. in max lengths of 10 ft. British—B S A Tools, Ltd.



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MULTI-WHEEL GRINDER — *Norton Co, Worcester 6, Mass.* For grinding parts having multiple diameters. Operating cycle is controlled either manually or by electrical timing. Multiple 36-in.-dia wheels are carried on spindle body to max span of 30 in. Wheel truing device, hydraulically operated, uses master gage and dresses all wheels simultaneously. Type CM-1.

VERTICAL CHUCKING GRINDERS —*The Bullard Co, Bridgeport 2, Conn.* Variable-speed drive provides infinitely variable table speeds; grinding heads have hydraulic drive with choice of 12 speeds. Fine feed and adjustable dwell; stroke length controlled by adjustable cams; head swivels 30° to right or left; side head swivels 20° up or down. Push-button controls; automatic lubrication; lockout switches and interlocks; hydraulically operated wheel dressers. Model sizes are 30, 36, 42, 54, 64, and 74 in.

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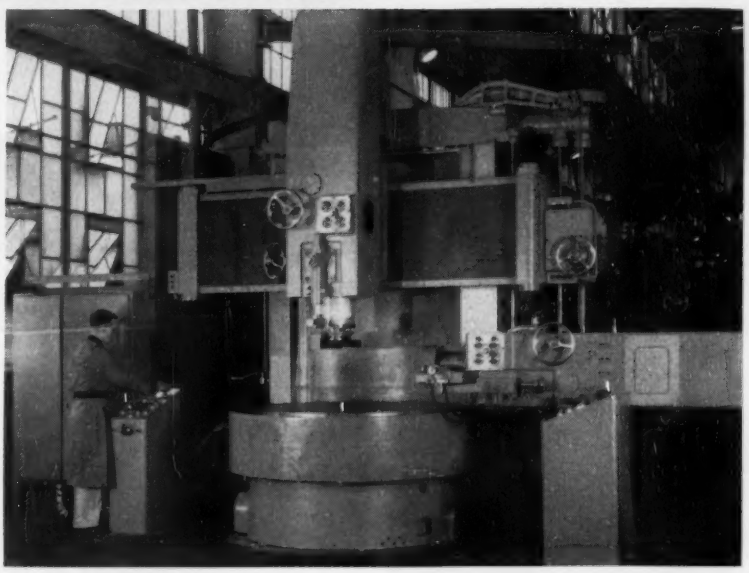
CENTERLESS GRINDER — *Eric R Bachmann Co, 27-11 41st Ave, Long Island City, 1, NY.* Incorporates attachment adapting it for production grinding of rotors and rotor shafts for small electric motors. Capacity is ⅝, 1¼, or 4 in.; available for infeed or through-feed. German—Herminghausen.



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UNIVERSAL MACHINE TOOL—*Newage International Inc, 235 E 42nd St, New York 17, NY.* Attachments enable machine to perform 50 different operations. 19 spindle speeds range from 64 to 2150 rpm; extra speeds of 2250 and 2700 rpm can be obtained. Rise-and-fall compound table has hand-operated travel through leadscrews. British — Rindis.

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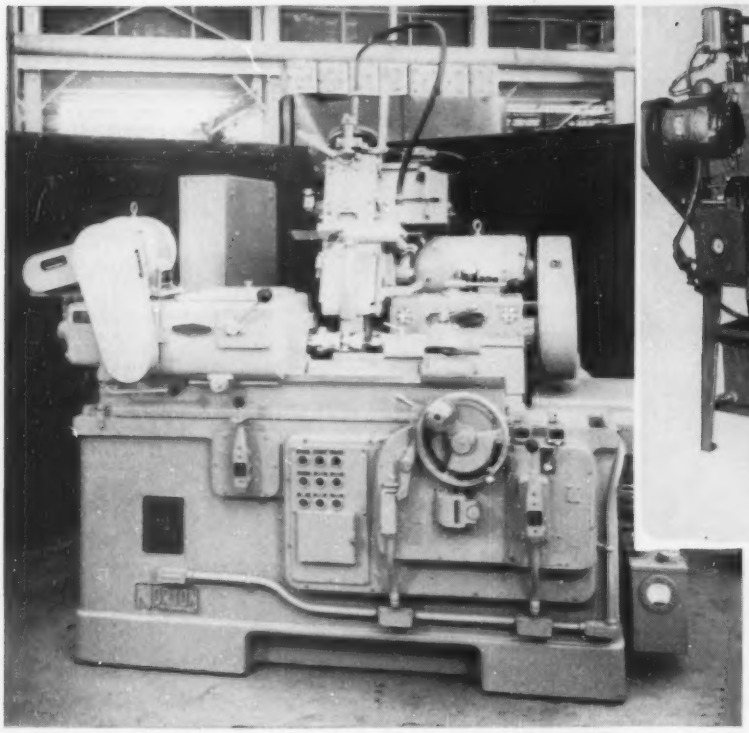
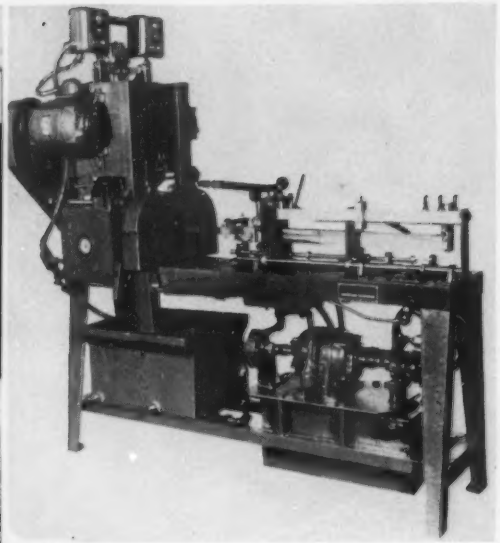
AUTOMATIC GRINDER—*The Standard Electrical Tool Co, 2480 W Sixth St, Cincinnati, Ohio.* Dual grinder heads operated by hydraulically controlled air cylinders. Features predetermined angular movement with special workholders and rotary magnetic chucks. Type A.



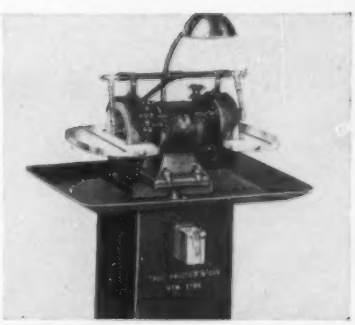
PISTON GRINDER—*Norton Co, Worcester 6, Mass.* Semi-automatic machine grinds elliptical automotive and aircraft pistons and can be tooled to grind complex skirts. Wheel feed mechanism is hydraulically actuated.



HOLLOW GRINDER — *Nicholas Equipment Co. Bellevue, Ohio.* Handchucking, hydraulically actuated unit operates on automatic cycle and grinds two sides of work simultaneously. Cam control permits following intricate patterns. Working stroke is 11 in.; wheel size, 9½x⅝ in.

GRINDER — *Curtis Machine Corp, Jamestown, NY.* Horizontal platen; said to be only one of its kind with serrated rubber contact belt. Equipped with two-speed motor, platen, and contact roll. German.

HYDRAULIC KNIFE GRINDER — *The Hill Acme Co, 1201 W 65th St, Cleveland 2, Ohio.* Grinds straight flat surfaces or straight and concave bevels of any desired angle. Wheelhead tilts from vertical position. Table speeds are variable to 100 fpm. Max length of stroke is 10 in.



CARBIDE TOOL GRINDER—*Standard Electrical Tool Co, Cincinnati 4, Ohio.* Has 6-in cup grinding wheel on left side and 4x54 in. abrasive-belt assembly on right side. Both sides incorporate precision tilting table.

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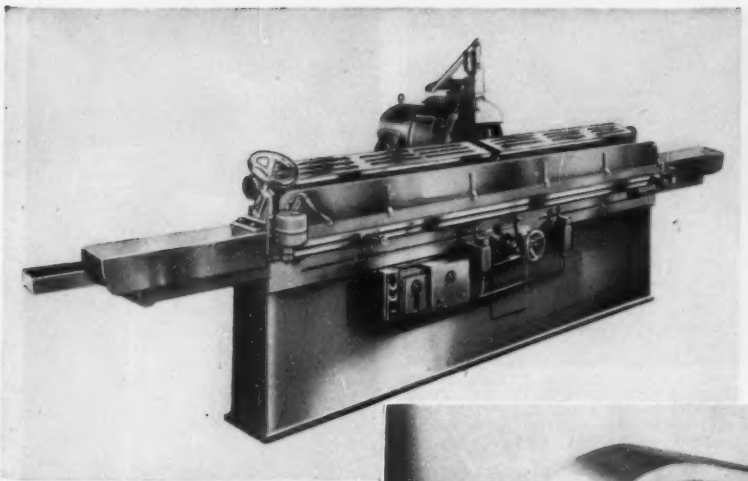
CARBIDE GRINDER—*Thomas Prosser and Son, 120 Wall St, NY 5, NY.* Variation of model AA provided with separate coolant system for wet grinding. Model AW.



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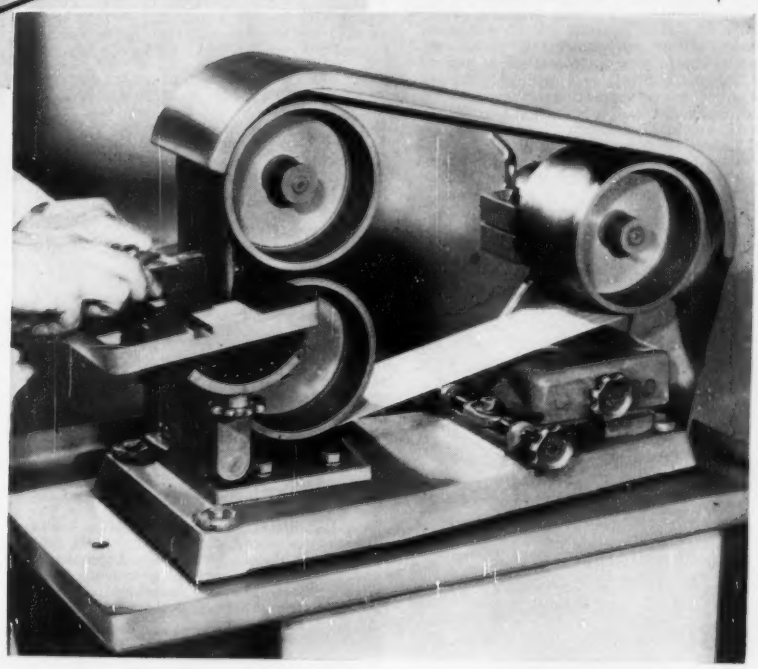
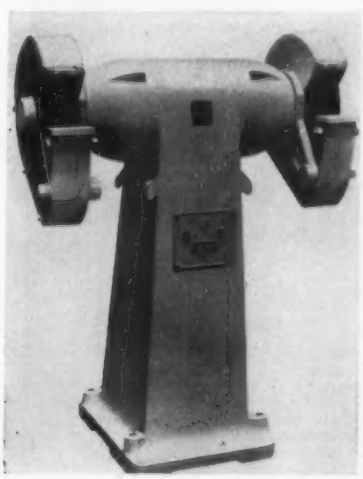
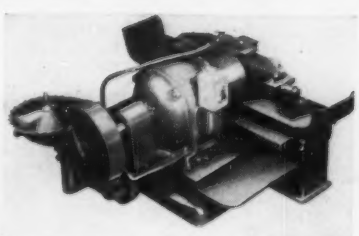
AUTOMATIC KNIFE GRINDER — *Hanchett Mfg Co, Big Rapids, Mich.* Capacity from 32 to 108 in.; automatic table-drive transmission; forced-feed lubrication. Larger models available. Model DN.

ABRASIVE-BELT MACHINE — *Minnesota Mining and Manufacturing Co, St. Paul, Minn; and Hammond Machinery Builder, Kalamazoo, Mich.* For finish-grinding carbide tools. Two-step sharpening technique is used: (1) rough-grinding on standard 60-grit silicon-carbide wheel; (2) finishing sides and top of carbide tip on machine with Tri-M-Ite Resinite abrasive belt ranging from 60 to 150 grit. Machine is designed for wet grinding with conventional waterproof abrasive belts. ↓

SANDER AND GRINDER — *Rankin Bros Precision Machine and Tool Works, Lynwood, Calif.* Handwheel tilts table from 45° up to 45° down; another moves table down 11 in. to expose entire disc. Miter gage can be set at angles to 90° in both directions. 16- or 20-in. disc.







BENCH GRINDER—*Samuel C Rogers & Co, 185-201 Dutton Ave, Buffalo 11, NY.* Sharpens knives to 22-in. length; attachments handle gumming of circular saws to 20-in. dia and drills to 1-in. dia. Knives mount on reciprocating table which moves in front of 6-in.-cup grinding wheel. Type EE.

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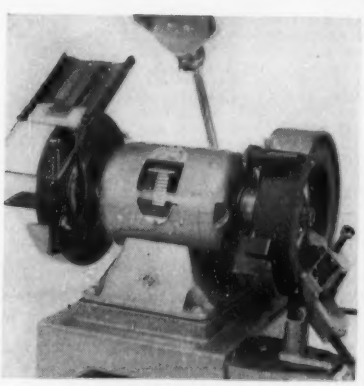
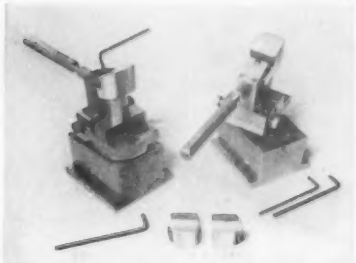
POLISHER AND GRINDER—*Newage International, Inc, 235 E 42nd St, New York 17, NY.* Provides workspace for two operators. Large shafts and heavy-duty bearings sustain heavy loads. British—The Stamford Works.



TOOL AND DRILL GRINDER—*The DoAll Co, Des Plaines, Ill.* Twist-drill range is from No. 60 wire size to ¾ in. Permits grinding of point angles from 45 to 75°, clearance angles from 6 to 150°, and chisel-point angles from 117 to 135°. Average time to sharpen drill is less than a minute.

PRECISION TOOL GRINDER—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Double-end model with reversible motor sharpens boring, turning, and facing tools (left- or right-hand) up to ⅝-in. square. Uses 6-in. cup wheels. U-shaped toolrest tables tilt to required angle. Style 44-A.

CARBIDE-TOOL GRINDER—*Hammond Machinery Builders, 1600 Douglas Ave, Kalamazoo, Mich.* For wet or dry operation; uses 6-in.-dia wheels. In-and-out table adjustment is accomplished by screw feed. Model WD6.



RADIUS GRINDING—*Apex Tool & Cutter Co. Inc. Shelton, Conn.* Fixture for dressing radius tools of serrated-inserted type used for finishing axles with ⅛- to ¾-in. radius. Fits table of any standard tool and cutter grinder.

GRINDER ATTACHMENTS — *Brown & Sharpe Manufacturing Co, Providence 1, RI.* For No. 5 and No. 10N cutter and tool grinders; sharpen peripheral and end teeth of straight-shank end mills from ⅛- to ⅜-in. dia. Tooth being sharpened is held in contact with tooth rest while feeding cutter across wheel by longitudinal table movement.

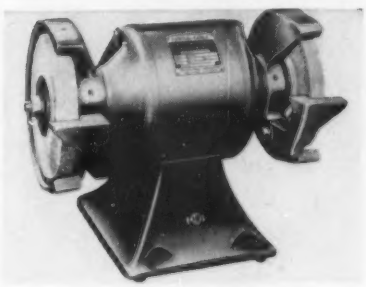
CARBIDE-TOOL GRINDER — *The Dynatomic Corp, 7 S Dearborn St, Chicago 3, Ill.* Uses extremely high wheel speed together with grinding fluid whose molecular decomposition is said to reduce heat to fraction of normal. Auxiliary slow-speed drive motor is mounted in base for dressing and truing.

TOOL AND CUTTER GRINDER—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Sharpens gear-cutting hobs with stationary hob table and reciprocating grinding wheel. Max dia of work is 12 in.; lead range on spiral flutes is from 15 to 750 in.; max grinding length is 16 in. Machine is hydraulically controlled and automatic in operation. Accuracy of indexing is reportedly within 0.0001 in.

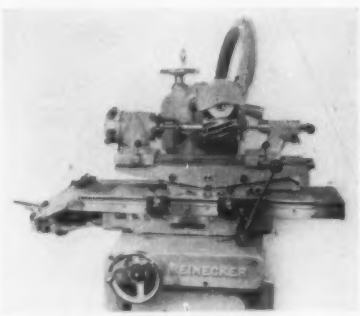
WEB-THINNING ATTACHMENT — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* For Cawi twist drill grinder. Pushbutton indexing device turns chuck and drill after thinning one side of web. Provision is made for tilting entire attachment to conform to lead of drills.

GRINDING ATTACHMENT — *Shelboerg Mfg Co, 29 Ridgeview Drive, Indianapolis, Ind.* Supplies accurately controlled flow of coolant to center of wheel. Excess coolant enters hood from which sludge is collected for diamond-dust salvage.

TOOL GRINDER—*South Bend Lathe Works, 425 E Madison St, South Bend 22, Ind.* Designed for increased work area; motor is mounted in pedestal; spindle is set forward on pedestal. Available with 8- or 10-in. wheels.



BENCH GRINDERS — *Porter-Cable Machine Co, 14 Exchange St, Syracuse, NY.* Series of four models. 116 is ¼-hp, 6-in. lathe-type unit. Price: $41. 517 is 1/3-hp unit taking 7x¾-in. wheels. Price: $72. 518 is ½-hp model taking 8x1-in. wheels. Price: $102. 519 has 1-hp motor, takes 10x1-in. wheels. Price: $135.



TOOL GRINDER—*Kurt Orban Co, 205 E 42nd St, New York 17, NY.* Adaptable to production or sharpening of hobs, drills, counterbores, reamers, and milling cutters. Employs two cross guides and system of rollers to generate helical pitch by longitudinal movement of table. German—Reinecker.

PRECISION GRINDER — *Thomas Prosser & Son, 120 Wall St, New York, NY.* Said to produce perfect edges and exact angles on all types of cutting tools, including HSS, carbide, and Stellite. Feed of tool toward grinding wheel is controlled by micrometer feed knob. Bench or floor types for either wet or dry grinding.

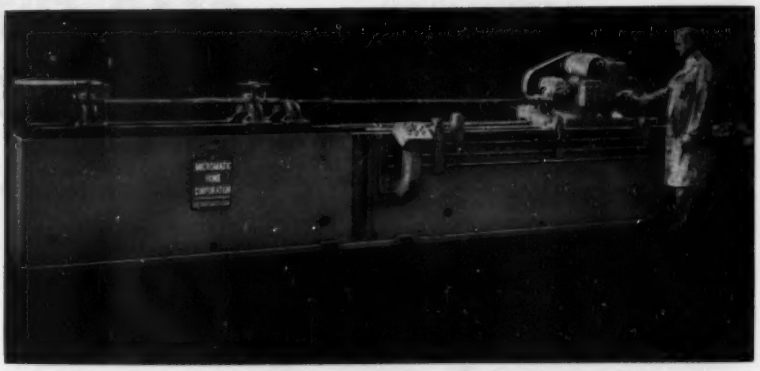
TWIST-DRILL GRINDER—*Alden Industries, 135¼ Sackett St, Cuyahoga Falls, Ohio.* Uses two holders to sharpen straight- or taper-shank twist drills from ⅛ to 1½ in. Calibrated for 90°, 130°, and 140° points as well as standard 59°. Model 200.

CARBIDE GRINDER — *McDonough Mfg Co, Eau Claire, Wis.* Redesigned for greater operator convenience. Quick-acting levers have replaced hex nuts.

BENCH GRINDER—*McDonough Mfg Co, Eau Claire, Wis.* Model DB drill grinder is similar to model DA without carbide tool grinding feature. Capacity is ⅛ to 2½ in.; 2-, 3-, and 4-lip drills are handled without changing setup. Wheel is 6x1½x½ in.

TOOL GRINDER—*Standard Electric Tool Co, Cincinnati 4, Ohio.* Planematic face or tool grinder accommodates 14-in.-dia steel-back or segment wheel. 8x 21-in. table tilts from 3° above to 30° below horizontal. Table has manual or hydraulic traverse. Coolant is reportedly supplied to wheel without spray or splash. Type C.

CUTTER GRINDER—*J Arthur Deakin & Son, 150-28 Hillside Ave, Jamaica LI, NY.* Cabinet and bench models of single-lip-cutter grinders. Universal head, cross-slide, and micrometer adjustment. British—George H Alexander, Ltd.



CUTTER GRINDER — *New Hermes Engraving Machine Corp, 13 University Place, New York 3, NY.* Designed for spring collets; capacity ½-in. dia; equipped with indexing device for grinding single lip, two-, three-, and four-sided cutters. Model GG 2.

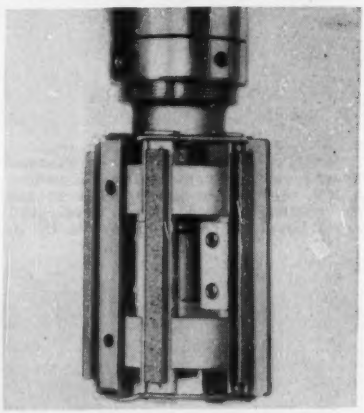
CUTTER GRINDER—*Kerns Manufacturing Corp, Long Island City, NY.* Handles all types of complex contour-milling cutters as well as ordinary cutters. Column will rotate through 360° about its floating center.

GRINDING FIXTURE—*S & D Engineering Co, 525 Commercial St, Glendale, Calif.* For relief grinding of end mills, spiral and straight flutes, countersinks, spot facers, centerdrills, and reamers. Rocking head permits drawing cutter away from wheel for indexing.

LAPPING PLATE—*Knuth Engineering Co, 2617 N St Louis, Chicago, Ill.* Used in conjunction with special powder. Said to permit lapping with a few strokes. Savhone.

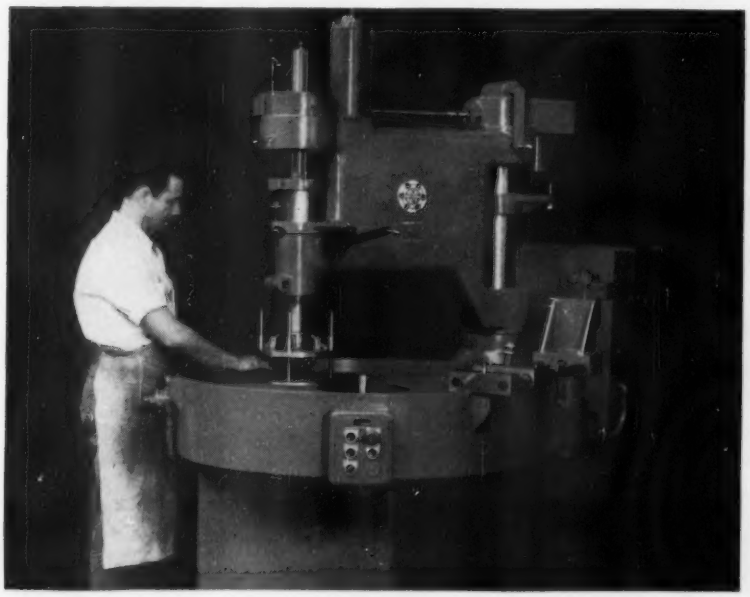
GUN BARRELS — *Micromatic Hone Corp, Detroit, Mich.* Horizontal Hydrohoner, with automatic feed and sizing controls, microhones barrels up to 4-in. dia with tolerance of a few "tenths." Model 606.

VERTICAL HONING MACHINES—*C Allen Fulmer Co, First National Bank Bldg, Cincinnati 2, Ohio.* Max stroke length is from 96 to 144 in.; can be tooled for honing capacities to 54 in. Model 30/144 hones cylinders up to 30 ft long with working stroke varying from 10 to 144 in; cylinder-bore-dia capacity is 4 to 36 in. Cylinders are honed in three sections—accomplished by reversing them and then using extension for center section. Max shoulder height at junctions is reportedly 0.00025 in.



HONING TOOLS—*Barnes Drill Co, Rockford, Ill.* Complete line of honing tools and abrasives in three basic types. Type A for conventional stone and shell assemblies for applications involving a range of diameters. Type B is also general-purpose tool, but body is flange-type with slots supporting stone for its full length. Type C for specific applications and small-diameter work — stone holders are not required.

HONING ATTACHMENT — *National Pioneer Co, 113¼ Nebraska Ave, Toledo 7, Ohio.* Converts manually operated honing machines into completely automatic units. Standard attachments are available for practically all horizontal honing machines.



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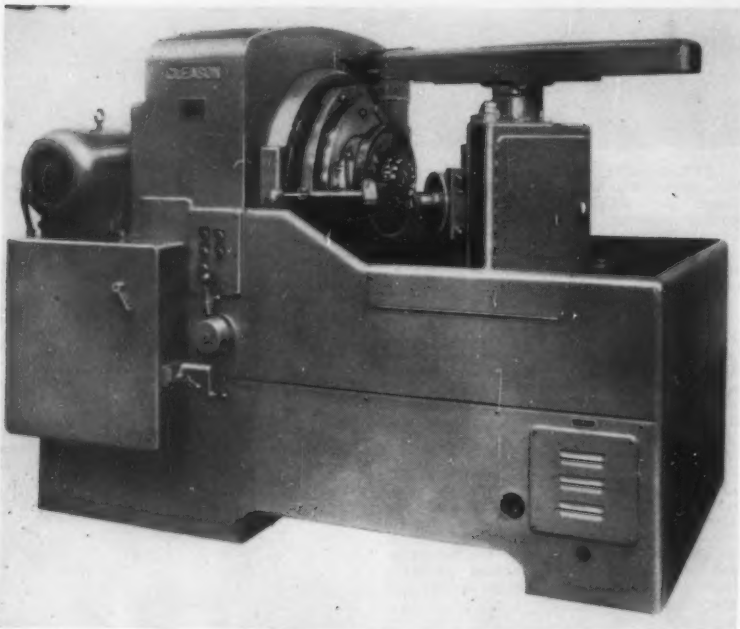
MICROHONING MACHINE — *Micromatic Hone Corp, Detroit 4, Mich.* For precision finishing of optically flat surfaces to 20 in. in dia. Spindle speed may be changed by inserting one of four worm gears.

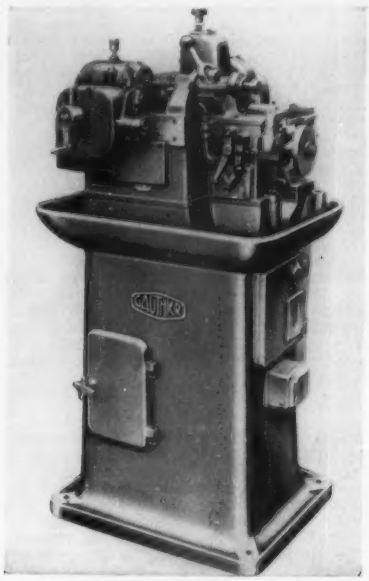
1954

GEAR CUTTING AND FINISHING

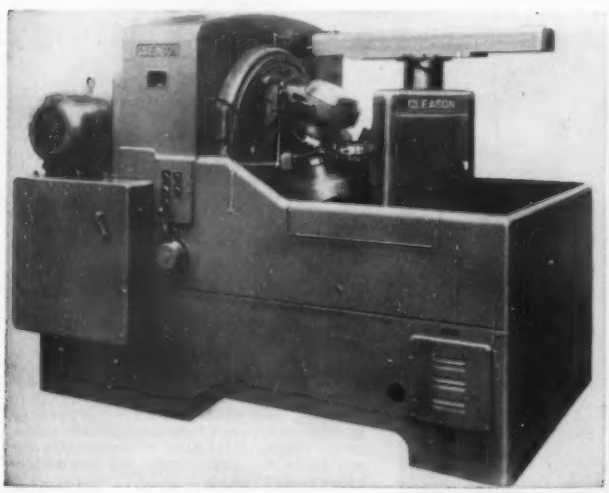
summarized from descriptions published during 1953



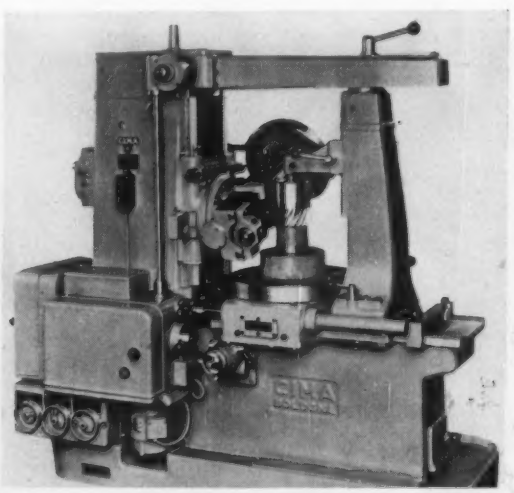
HYPOID GENERATOR — *Gleason Works, 1000 University Ave, Rochester 3, NY.* Automatic high-speed machine for cutting hypoid, spiral bevel, and Zerol bevel gears from 2 to 8½ in. in dia. Generating motion is actuated by large cylindrical cam; spindle adjustments provide universal cutter tilt. Cutter speed can be varied from 84 to 380 fpm.



GEAR HOBBER—*Eric R Bachmann Co, 27-11 41st Ave, Long Island City 1, NY.* Handles gears from 1/16 to 2⅝ in. All adjustments are made by exterior controls and change gears. Cuts gears with from 6 to 230 teeth and pitch diameter from 32 to 170. Eight hobbing speeds range from 500 to 2500 rpm. German—Gauthier.

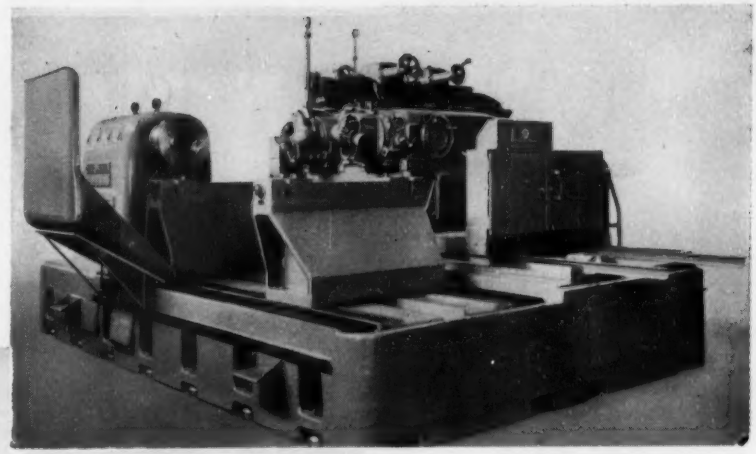


GEAR GENERATOR—*Gleason Works, 1000 University Ave, Rochester 3, NY.* Straight-bevel Coniflex generator is completely automatic and cuts gears to 8½-in. dia, 1⅜-in. face width, and diametral pitch of 3. Two multi-blade, interlocking, disk-type cutters rotate on axes inclined to face of cradle. Cutter speed varies from 80 to 300 fpm. Production rate is 3 to 40 sec per tooth. A companion machine was specially designed for sharpening 4½- and 9-in.-dia cutters at rate of 4 sec per blade. Series No. 104.

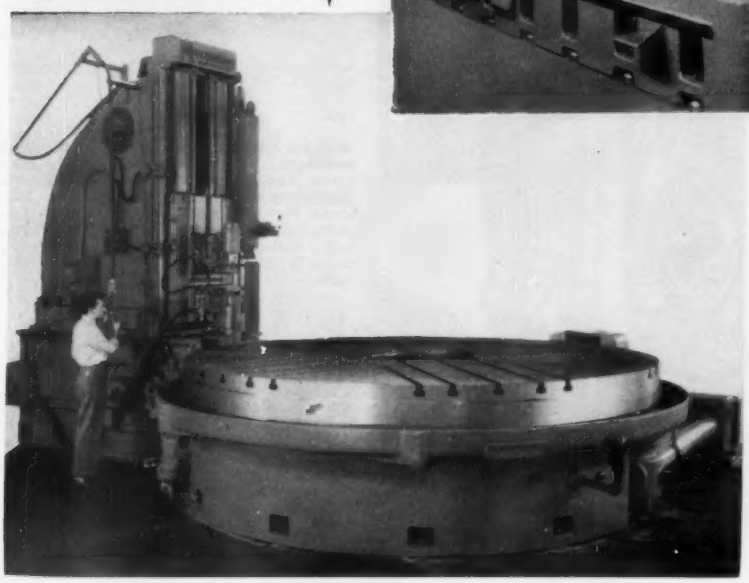


GEAR HOBBER—*George Scherr Co, Inc, 200 Lafayette St, New York 12, NY.* Cuts spur, helical, spiral, and worm gears; differential mechanism eliminates calculations. Nine speeds from 50 to 212 rpm; max diametral pitch is 5. Italian—Cima.

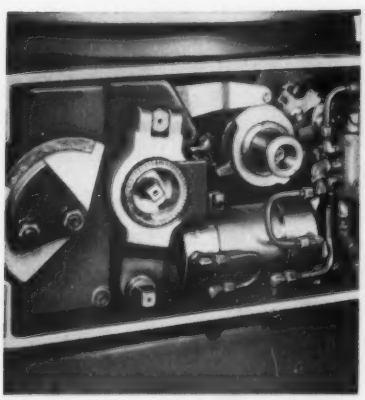
GEAR SHAVER—*National Broach & Machine Co, 5600 St Jean, Detroit 13, Mich.* Handles spur, helical, and herringbone gears having pitch diameters from 24 to 96 in., with diametral pitches from 2 to 16. Two cutterheads speed herringbone gear shaving operations.



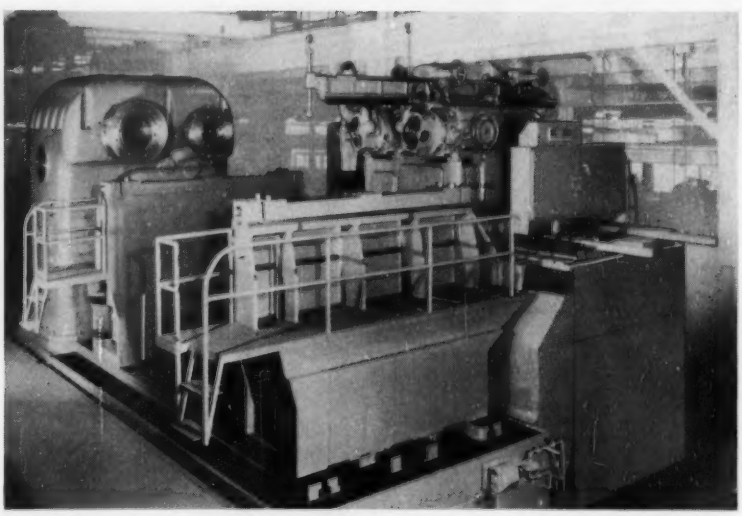
LARGE GEAR SHAVERS—*Michigan Tool Co, 7171 E McNichols Road, Detroit 12, Mich.* Four models with capacities of 48, 72, 120, and 180 in. handle spur, helical, or herringbone gears. Accuracy is reported as a few "tenths"; surface finish as 12 mu-in. rms. Enables use of multiple-thread hobs for roughing. Series V.



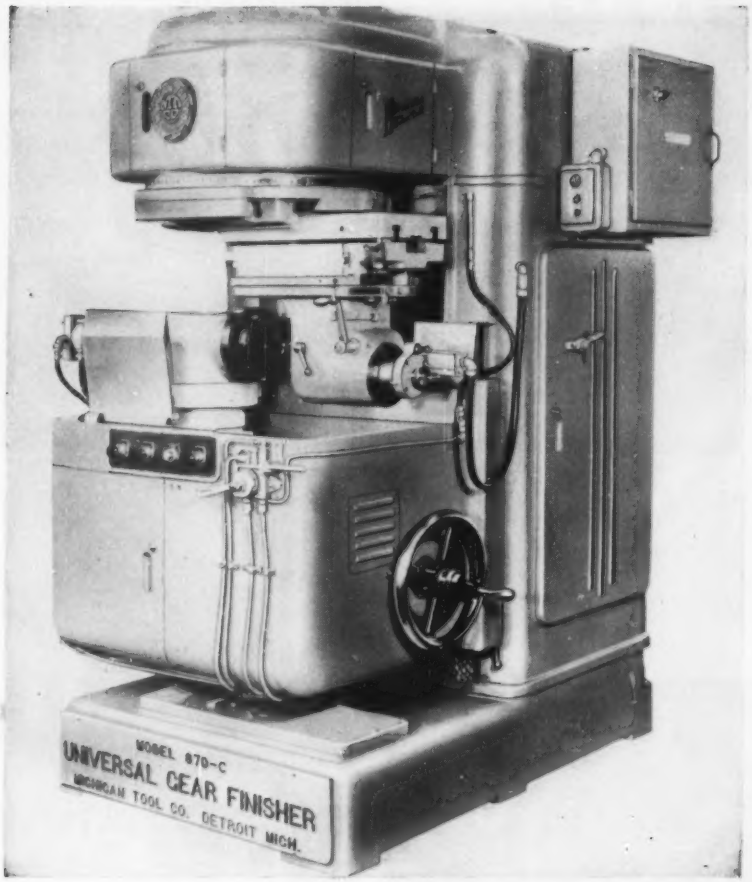
GEAR HOBBERS—*Morey Machinery Co, Inc, 410 Broome St, New York, NY.* Line includes universal hobbers, pinion-hobbing machines, gear shavers, spline hobbers, production-hobbing equipment, and relieving lathes. Sizes from 15 to 240 in. British—David Brown.



GEAR SHAVER UP-FEED—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* For installation in Red Ring diagonal gear-shaving machines to provide automatic precision up-feed in selected increments throughout shaving cycle and automatic return to proper backlash position for loading and unloading. Diagonal shaving cycle may include several cutting strokes, each with own increment of up-feed and one or more idling strokes.



HORIZONTAL GEAR SHAVER—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Built for horizontal-axis shaving with work rotating in journal bearings as it is when assembled. Handles gears with diameters from 2.5 to 15 ft and, with modifications, to 16 2/3 ft. Cutterhead assembly includes two cutter slides with journal-alignment checker between them. Accuracy for properly hobbed gears is reported to be within a 0.0003-in. error in pitch or index and a 0.0002-in. error in tooth profile.



CHAMFERING MACHINE — *Modern Industrial Engineering Co, 14230 Birwood Ave, Detroit 4, Mich.* Burrs and chamfers all teeth of 14-in.-dia. 156-tooth flywheel ring gear in 8 sec. Locating finger, moving with formcutting tools, automatically locates gear teeth radially on each stroke. Model BM-2029.

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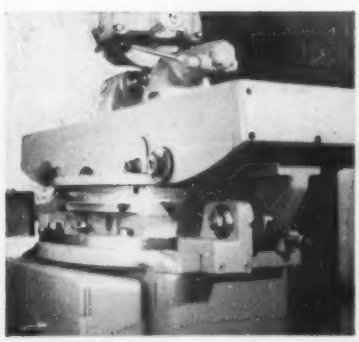
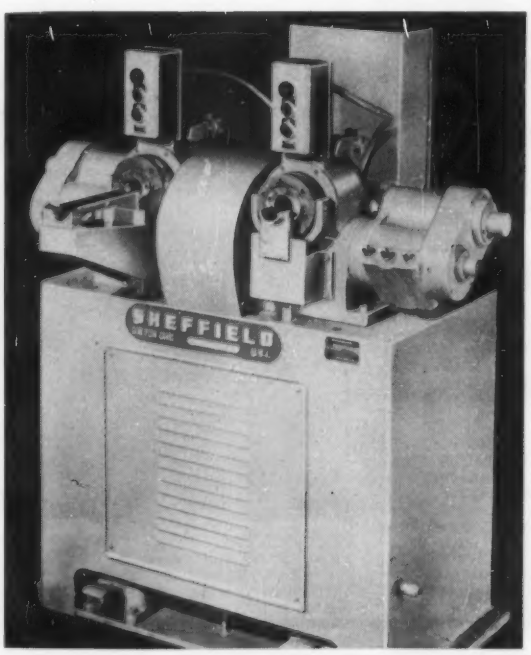
INTERNAL GEAR FINISHER — *Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Finishes spur and helical internal gears with up to 12-in. OD and gears with pitch diameters as small as 4 in. Transverse (reciprocating) shaving method uses serrated-tooth cutter. Automatic upfeed provides 1 or 2 finishing passes. Adjustments for spindle speed, reciprocating action, cycle time, loading, and unloading are provided. Max stroke 5 in.; max gear width 4¾ in.; cutter pitch dia 3 to 6 in. Model 870-C.



SHAVING MACHINE — *National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Model GCU has been redesigned to allow gear-tooth crowning by conventional method of rocking machine table during shaving cycle. Crowning can now be done with standard rotary cutter while work is being reciprocated in line with its axis.

INTERNAL BURRING—*The Sheffield Corp, Dayton 1, Ohio.* Chamfers the involute contour of internal spline and gear teeth, either straight or helical. Production rate varies up to 300 teeth per minute.



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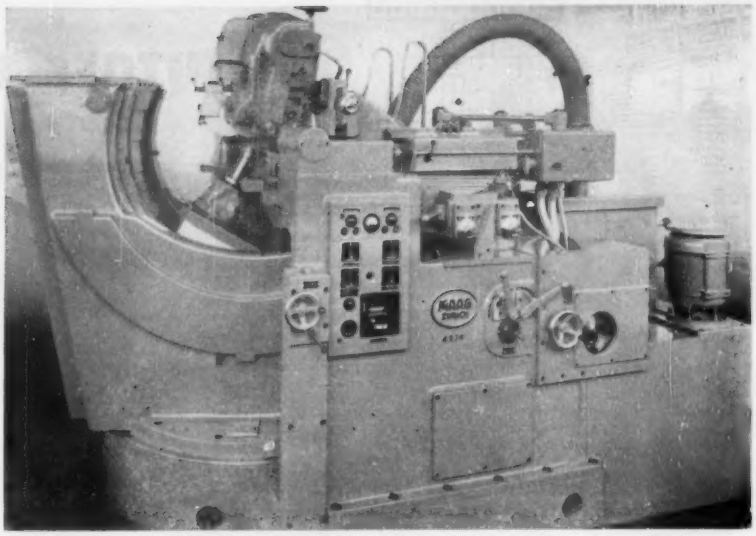
GEAR BURRING MACHINES — *The Sheffield Corp, Dayton 1, Ohio.* Use fly-tool to remove burr and put slight chamfer on spur or helical gears. Series 350 handles gears to 7 in. and uses two cutterheads with one workhead. Series 370 handles gears to 4 in. and has one cutterhead per spindle. Production rate is 300 teeth per minute.

FLAME CUTTER—*Cogmatic Co, 1330 N Franklin Place, Milwaukee, Wis.* Three spindles; cuts and hardens gears with 15-in. dia, three at a time; with 25-in. dia, two at a time.



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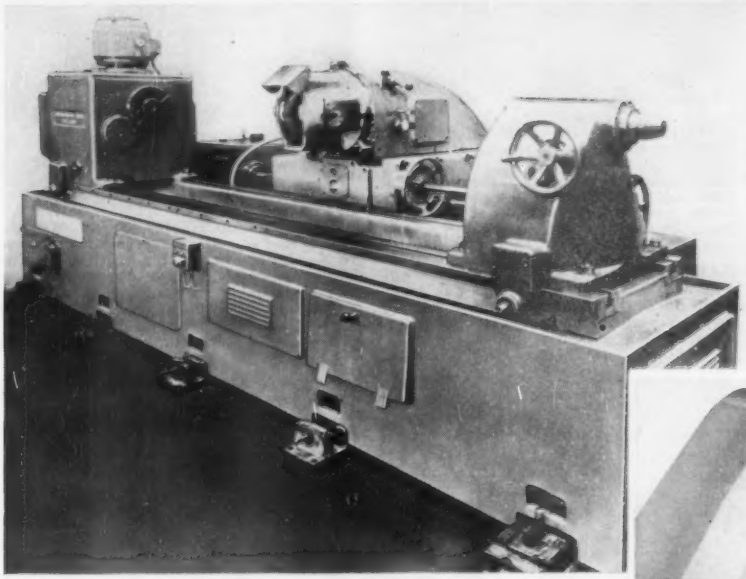
BEVEL-GEAR GRINDER—*High Precision Products, Westfield, NJ.* Grinds straight or oblique bevel gears up to 16½-in. dia. Grinding is done without coolant. Profile is obtained by generating through series of pitch blocks, rolling disks, and steel bands. Type KS-42. Swiss-Maag.



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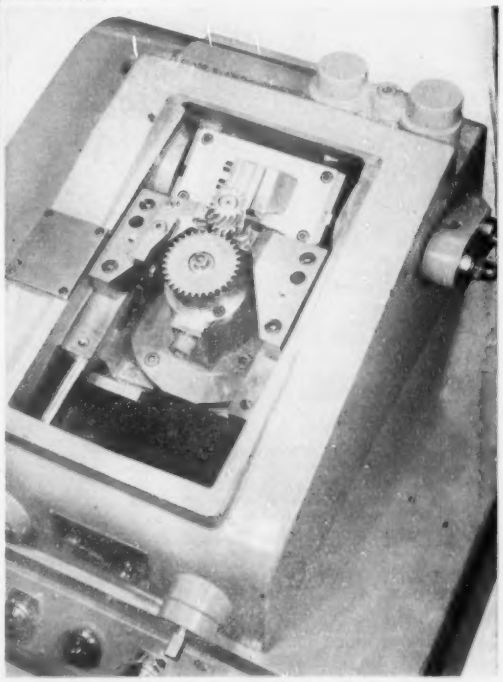
GEAR SHAVER — *Morey Machinery Co, Inc, 410 Broome St, New York, NY.* Horizontal machine designed for shaving gear-tooth profiles of large turbine pinions with dia from 4 to 24 in. and length to 100 in. Shaving is done by radial loading method. Spindle speeds range from 21 to 300 rpm. British—David Brown.

GEAR BURRING MACHINES—*The Sheffield Corp, Dayton 1, Ohio.* Eight models handle aircraft gears, internal or external, up to 24 in., with time cycle as low as 0.2 sec per tooth. Burrs individual teeth in cluster work as well as separate gears. Series 80.



GEAR BURRING MACHINES—*The Sheffield Corp, Dayton 1, Ohio.* Series 340 and 360 includes single and double machines allowing use of hollow mill or pencil-type chamfer. Gears up to 13 in. are handled at rate of 300 teeth per minute.

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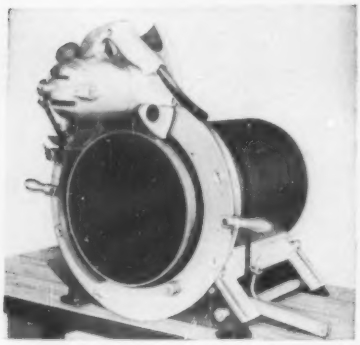
GEAR CHAMFERING MACHINE—*Modern Industrial Engineering Co, 14230 Birwood Ave, Detroit 4, Mich.* Finishes entire tooth form of helical and spur gears with pitch diameters from ⅝ to 9½ in., as well as external straight- and involute-form splines. Production rate for gears with 22 teeth is 600 per hr. Once machine has been tooled up and started, it does not usually have to be stopped to load and unload work. The index spindle carries a pilot gear which meshes with the work. Cutting-stroke cams furnished with machine cover variety of gears.

GEAR-SHAPER ATTACHMENTS—*Michigan Tool Co, 7171 E. McNichols Rd, Detroit 12, Mich.* Two devices: one is a pneumatic holding mechanism for automatic positioning of gear and clamping it in place; other is a manually controlled hydraulic device which ejects gear blank after operation is complete.

1954 AMERICAN PRODUCTION MACHINE TOOLS REVIEW

CUTOFF AND FILING

summarized from descriptions published during 1953



CUTOFF SAWS—*Tri-Clover Machine Co, Kenosha, Wis.* Two models cut ½-in. tubing with 6- or 12-in. length. Abrasive wheels cut aluminum, copper, stainless, and other metals. Unit is portable.

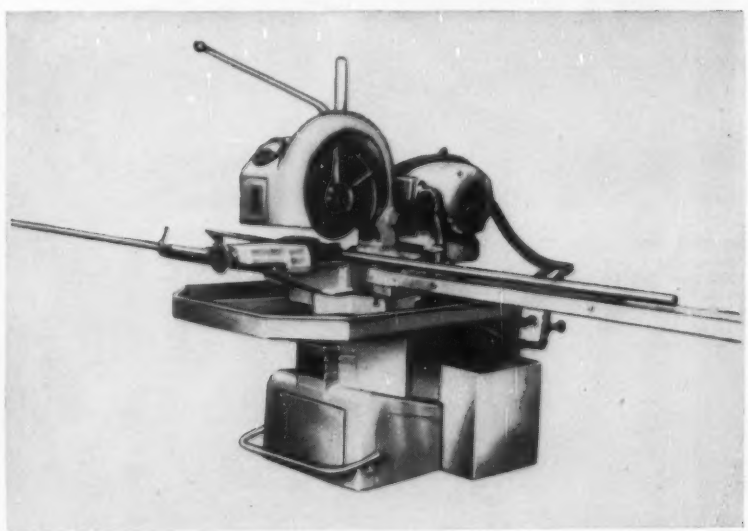
CUTOFF SAW—*Henry H Wise Co, 945 Wilshire Blvd, Los Angeles 17, Calif.* Attaching foundry head and locking cutterhead converts unit for gate and riser cutting. Reversing operation reverts saw to chop-stroke cutting of bars. Uses 18- or 20-in.-dia cutoff wheel.

CUTOFF MACHINE—*Stone Machinery Co, Inc, 501 Fayette St, Manlius, NY.* Can be converted in five minutes for freehand cutting of gates and risers from foundry castings. As a cutoff machine, either abrasive or semi-HSS saw blades may be used. Capacity is 2½-in. solid and 4-in. pipe. Model M75.

CUTOFF MACHINE—*A P DeSanno & Son, Inc, Phoenixville, Pa.* Cuts solid metal with 2.5-in. dia and 3.5-in. tubing. Ball-bearing spindle has speed of 2500 rpm. Equipped with quick-acting hand-operated vise, one for straight cuts and one for straight and angle cuts to 45°. Uses 18-in. disk.

ABRASIVE CUTOFF—*A P DeSanno & Son, Inc, Phoenixville, Pa.* Portable 10-hp machine for dry cutting using 18-in.-dia Resinoid-bonded wheel at speed of 2500 rpm. Cuts pipe with OD to 4 in. and solid stock to 2½ in.

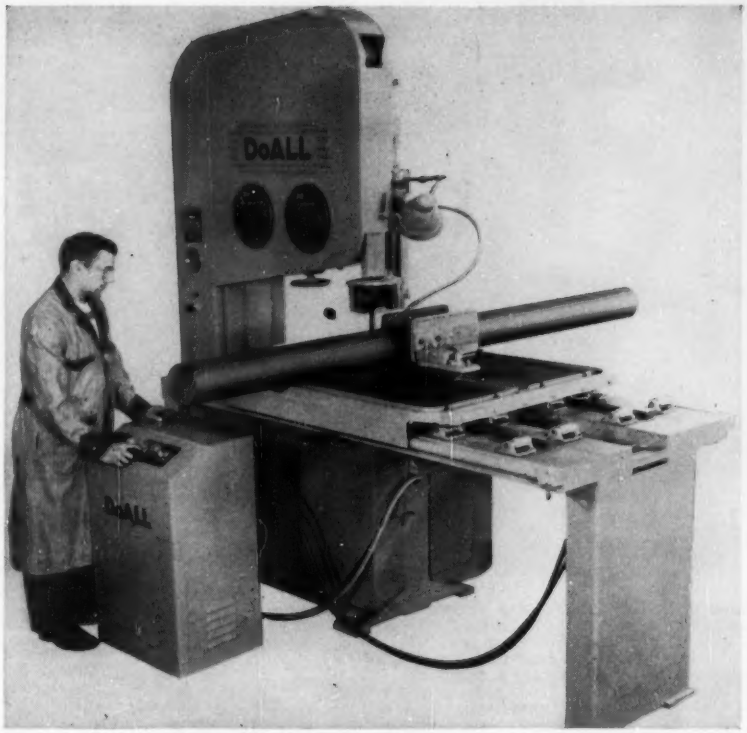
BANDSAW BLADES — *Henry G Thompson & Son Co, New Haven, Conn.* Made of HSS for work on stainless steel and hard alloys. Blade sizes are ¾ and 1 in. with 6 tpi. Available on rental-performance basis.

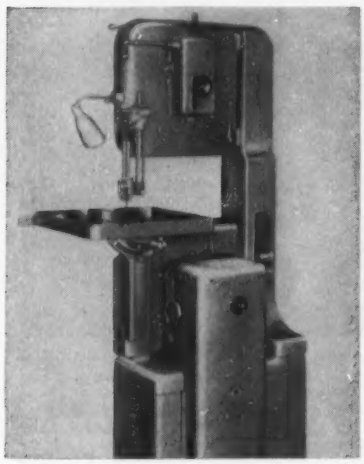


BOLT CUTTER—*Manco Mfg Co, Bradley, Ill.* Hydraulic angular cutter for flush trimming bolts to nut. Capacity is ⅞-in. mild steel. Can be obtained with cut-back jaws for use in splitting nuts. Power is supplied through portable hydraulic pump.

CUTOFF MACHINE—*Ballinger Div, Douglas Export-Import Corp, New York 4, N. Y.* Incorporates eccentric head and load indicator for high-speed abrasive cutoff. Indicator shows pressure of feed applied. Claimed to make cut parallel within 0.005 in.

BANDSAW—*The DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* Saw blade twisted 90° at table so work is fed from the front; length of stock is not limited by throat gap. Handles work from 2000 lb up to 15½-in. thickness under saw guides and 9½ in. at column. Speeds are from 40 to 10,000 fpm. Model CO-36.



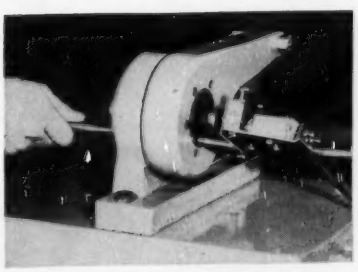


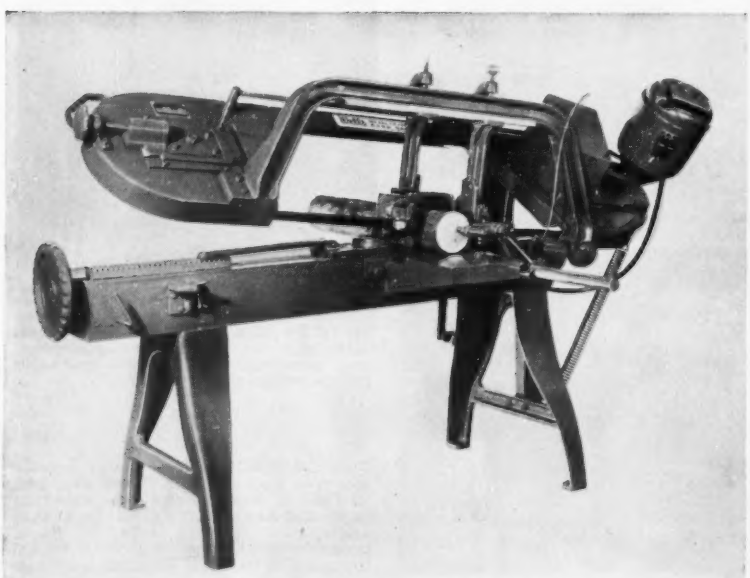
BANDSAW — *Walker-Turner Div, Kearney & Trecker Corp, Plainfield, NJ.* Capacity is 16-in.; low-speed range is from 50 to 450 sfpm, high-speed from 500 to 4500 sfpm. Table tilts 45° to right and 5° to left.

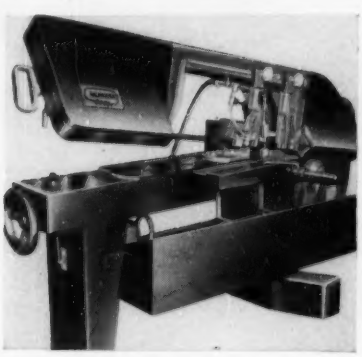
CUTOFF WHEEL—*Norton Co, Worcester 6, Mass.* Reinforced resinoid hub-type cutoff wheel improved to produce 1/3 more life. Available in dia of 7 and 9 in. with hole size of ⅞ in.

BANDSAW — *Wells Manufacturing Corp, Three Rivers, Mich.* HSS bandsaw blade of 1-in. width. Capacity is 8-in. dia. Model 800.

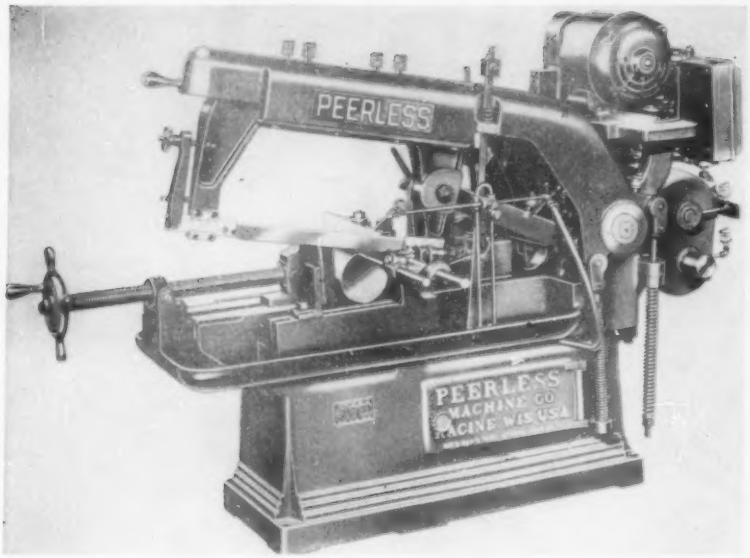
ROD-PARTER GAGE — *O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Makes possible over 9000 cuts per hr in bar stock with the Di-Acro power rod parter. Ten hole sizes accommodate stock from 1/16- to ⅝-in. dia. Gage is set for desired length of cut.







BANDSAW—*Kalamazoo Tank & Silo Co, Machine Tool Div, 15 Harrison St, Kalamazoo, Mich.* Cuts 8-in. round stock, 16-in. flat stock, and 8-in. pipe with an accuracy of a few thousandths. Saw-frame descent is controlled by hydraulic mechanism. Model 8C.



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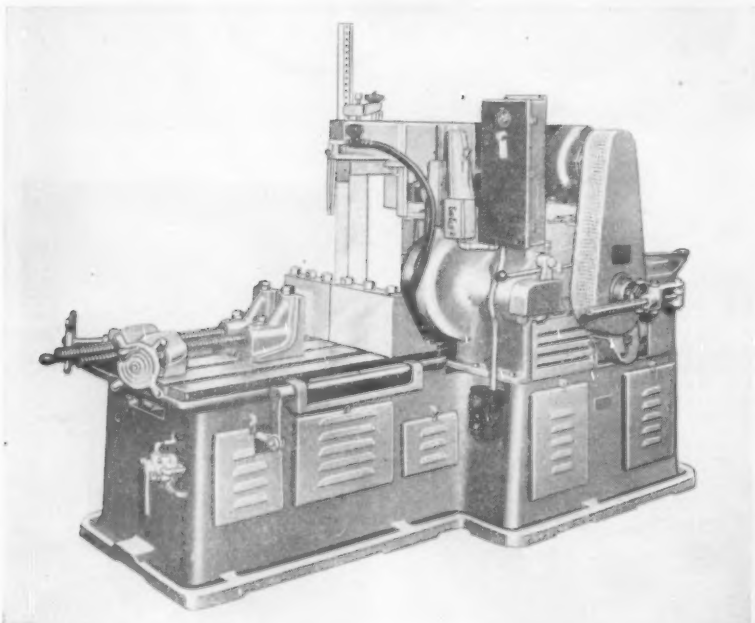
POWER SAW—*Peerless Machine Co, 1600 Junction Ave, Racine, Wis.* Heavy overarm carries and guides saw frame; vise clamps work from 90 to 45°. Capacity 10x10 in.

POWER ROD PARTER—*O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Motor-driven flywheel has replaced air-operated power unit to provide six times previous cutting speed. Rods and bars from 1/16 to ⅝ in. can be cut at 180 spm. Price: $505.



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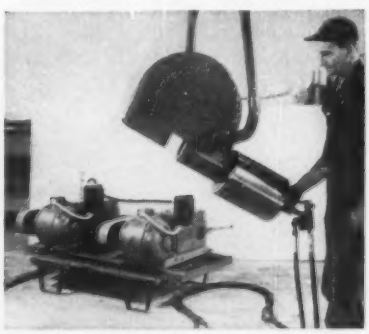
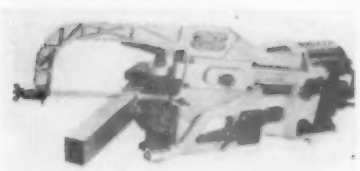
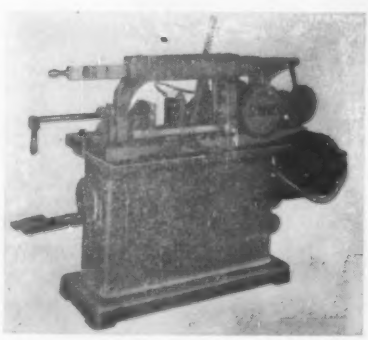
HACKSAW MACHINE—*Peerless Machine Co, 1600 Junction Ave, Racine, Wis.* Redesign includes larger hydraulic pump, improved feed piston and piston ring design, and cam-timing. Air cylinder counterbalances weight of reciprocating frame.



GUILLOTINE CUTTER—*Manco Manufacturing Co, Bradley, Ill.* Processes up to 2¾-in.-dia steel rod in 13 sec. Adaptable for cold-riveting, punching, and pressing. Two electro-hydraulic pumps provide 150-ton thrust.



PORTABLE HACKSAW — *Lipe-Rollway Corp, Emerson Ave, Syracuse 1, NY.* Portable 50-lb unit cuts metal, plastic, or fiber stock of 3-in. dia or less, at any angle from 45 to 90°. Tolerance is reportedly held within 0.010 in. Speed is 115 spm without load.



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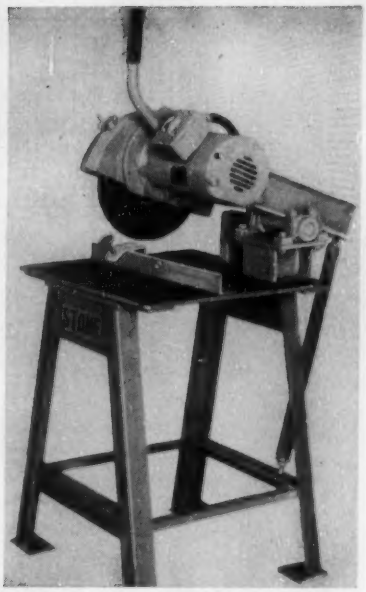
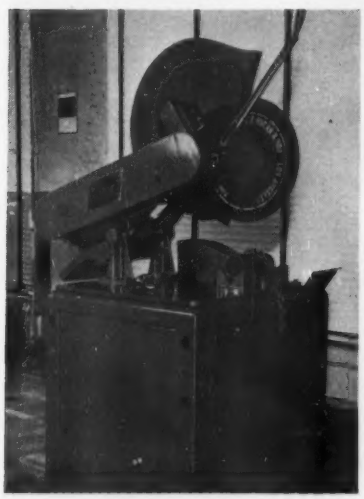
POWER HACKSAW — *Sales Service Machine Tool Co, 2363 University Ave, St Paul 1¼, Minn.* Swivel-base vise tilts to 45° and has capacity of 4x7 in. at that angle; max capacity is 7x7 in. Blade pressure can be varied from 0 to 200 lb; speed is 80 or 140 spm. Model No. 4.

ROD CUTTER—*Whitney Metal Tool Co, Rockford, Ill.* Consists of movable shear blade and fixed shearing die. Cuts mild steel rods with diameters from ⅛ to ¾ in. No. 400. Price: $50.

HYDRAULIC CUTOFF TOOL—*Manco Mfg Co, Bradley, Ill.* Cutting capacity up to ½x2-in. bar stock or channels to 9/16x2x2-3/16 in. Electro-hydraulic pump supplies 30-ton thrust. Model 20-339.



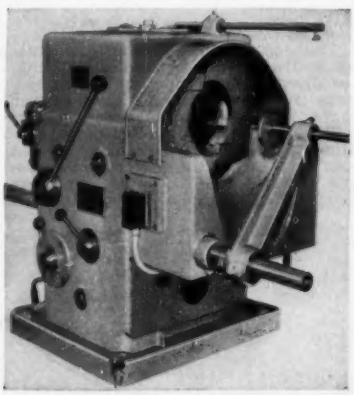
CUTOFF MACHINE—*Stone Machinery Co, Inc, 601 Fayette St, Manlius, NY.* Capacity for ferrous materials is 1½-in. solid and 2½-in. OD tube; for non-ferrous materials, 2½-in. solid and 3-in. tubing. A 12-in. abrasive wheel or steel saw blade is used. Model M-35. Price $445.



METAL-CUTTING SAW—*W F Obear & Son, 6075 South Normandie Ave, Los Angeles 44, Calif.* Will do multiple cutting of aluminum, dural, copper, monel, stainless, tool steel, cast iron and duroline. 4-in cast-iron pipe can be cut in 5 sec. Multiple V-belt drive; 5-hp motor.

SAW LUBRICATOR—*Aviation Lubricants Co, Inc, San Diego, Calif.* Said to eliminate saw chatter and stop work-hardening of metal in blade. Claimed to increase cutting speed on average of 30% and saw life 300%.

AUTOMATIC WIRE CUTTER—*Mettler Machine Tool, Inc, New Haven, Conn.* Infinite speed changes from 50 to 200 fpm. Straightens and cuts wire from 3/32 to ¼ in. Model 1AV.



TUBE CUTOFF MACHINE—*Henry A Spittler, 50 Church St, New York 7, NY.* Rotating cutters; hydraulic chucking; stationary tube. Five models handle diameters ranging from ⅜ to 7⅛ in.; cutting speed 90 fpm and up. German—Kieserling and Albrecht.

1954 AMERICAN PRODUCTION PREVIEW AND BUYERS GUIDE TO MACHINE TOOLS

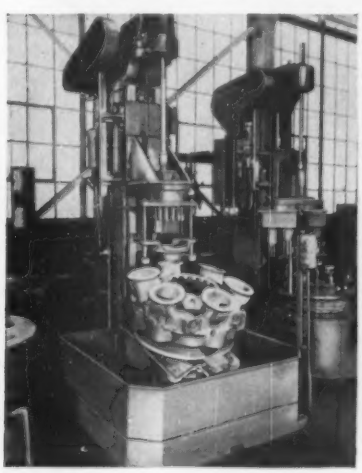
SPECIAL MACHINES

summarized from descriptions published during 1953

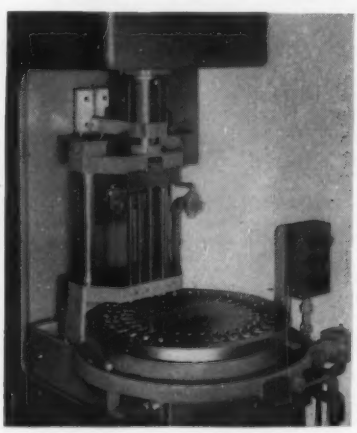
CARTRIDGE CASES 90mm—*Clearing Machine Corporation, 6499 West 65th St, Chicago 38, Ill.* Horizontal double-end hydraulic press handles cupping, four drawing, and tapering operations. Press features: compactness; lower height; no foundation pit; ready accessibility to dies; and ease of conveyorization. Variable capacity on each end from zero to 330 tons; closing and return speeds are 2200 ipm; pressing speed 200 ipm; and 25-ton ejector.

CYLINDER HEAD—*Turner Bros, Inc, 2625 Hilton Road, Ferndale, Mich.* Machine pressure-tests parts and washes out sand and chips.

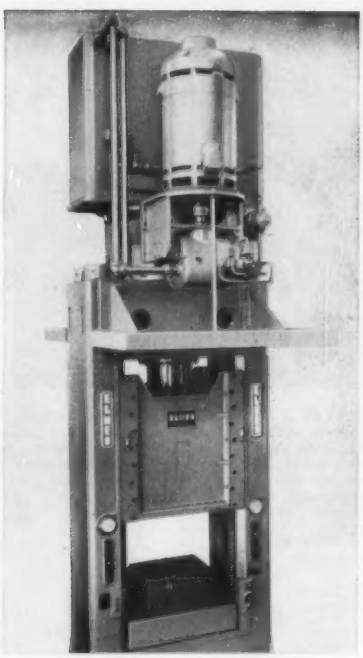
JET ENGINE SEGMENTS—*Colonial Broach Co, Box 37, Harper Station, Detroit 13, Mich.* Special trunnion fixture on standard 10-ton, 90-in. stroke horizontal broaching machine allows internal broaching of angular slots in jet engine segments. Angular adjustment is 15 to 45 deg; indexing is hydraulically powered.



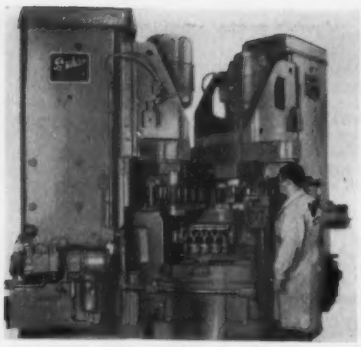
JET-ENGINE CASTINGS — *Standard Machine & Tool Co, Windsor, Ontario.* Machine drills 12 holes and drills and counterbores 2 holes in each of 6 flanges. Uses geared-drive head and six-station index table.



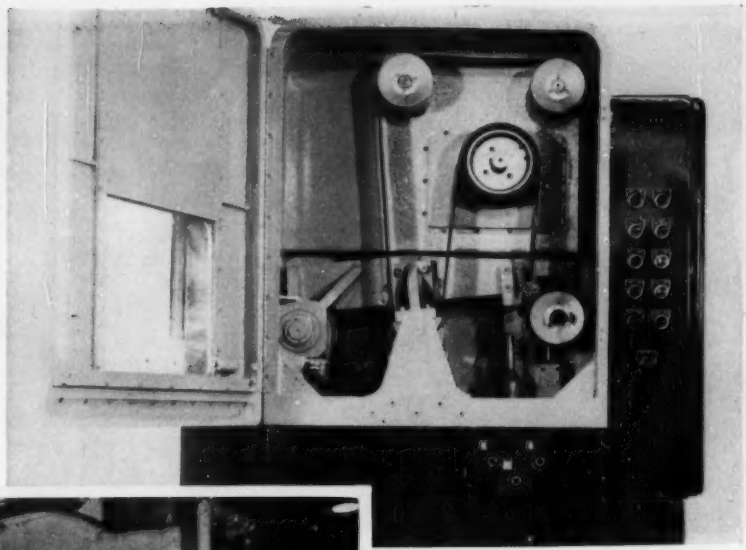
AUTOMOTIVE ROCKER ARMS — *Colonial Broach Co, Box 37, Harper Sta, Detroit 13, Mich.* 10-ton, 36-in.-stroke press strip-broaches and burnisheh 1800 automotive rocker arms per hr. Arms are broached four at a time with 0.010 in. of stock removed.



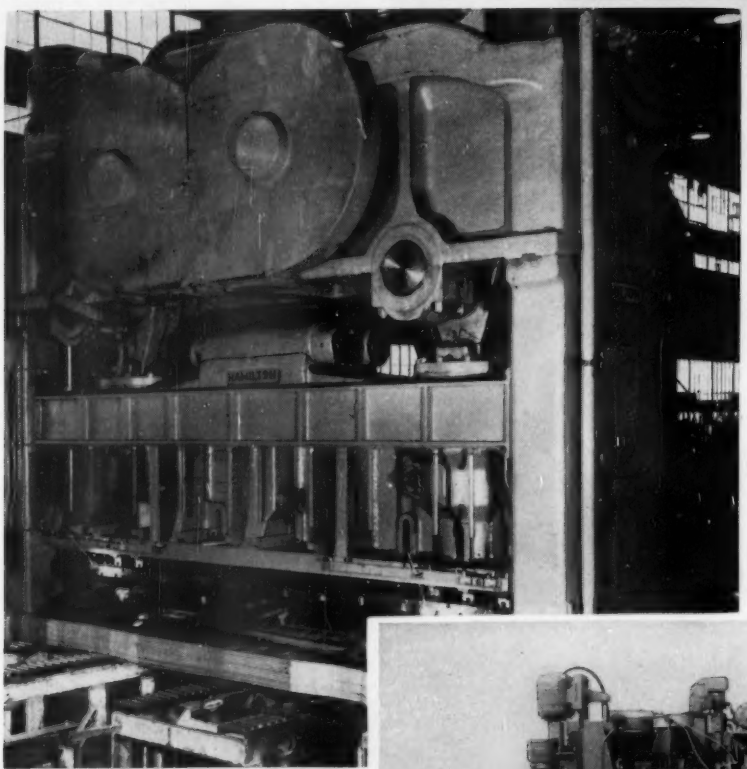
ARTILLERY PROJECTILES—*American Steel Foundries, Elmes Engineering Div, Cincinnati 29, Ohio.* 500-ton-capacity hydraulic drawing and forming press for cold-drawing and nosing artillery projectiles. Press is part of shell-forging process said to represent efficient compromise between hot forging and cold extrusion.



CONNECTING RODS—*Buhr Machine Tool Co, Ann Arbor, Mich.* Machine drills, reams, and chamfers 565 rods per hr with single operator. Eight-station holding fixture is mounted on 60-in.-dia index table. Parts are hydraulically clamped and automatically ejected.



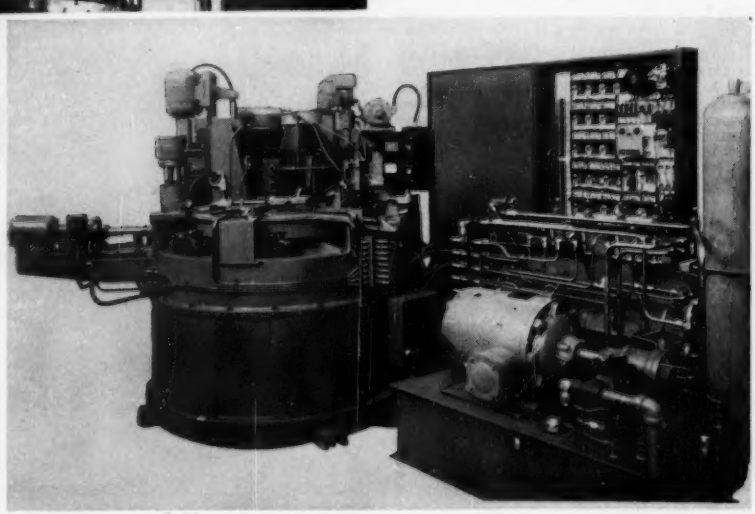
JET BUCKETS, BLADES — *Planet Products Corp, Cincinnati, Ohio.* Generating belt grinder, tooled for Sapphire turbine rotor and stator parts, removes stock at rate of 0.001 to 0.003 ips. Abrasive belt travels between master form and work; master forms are generated in the machine.



SPARK PLUG—*Mead Specialties Co, 4114 N Knox Ave, Dept LS-4, Chicago 41, Ill.* Assembly facilitated by electrical and pneumatic devices designed to drive home the locking nut on Duchess plugs. Basic machine member is air-press stand. Time cycle is 3 sec.

TRACTOR TRACK LINKS—*Lemaire Tool & Manufacturing Co, 2657 South Telegraph Rd, Dearborn, Mich.* Two-way drilling and reaming machine has four-station automatic indexing table. Hydraulic slide unit carries four-spindle drillhead; hydraulic feed unit carries ten-spindle drillhead. Production is 45 parts per hr.

TRUCK CHASSIS SIDE RAILS — *Hamilton Press Div, Baldwin-Lima-Hamilton Corp, 425 Curtis Bldg, Detroit 2, Mich.* Press cold-stresses tie rods with hydraulic jacks to form side rails for truck chassis. Bed is equipped with six 42-in.-dia air cushions providing 415 tons of pad pressure with air at 100 psi. Stroke of slide is 22 in.



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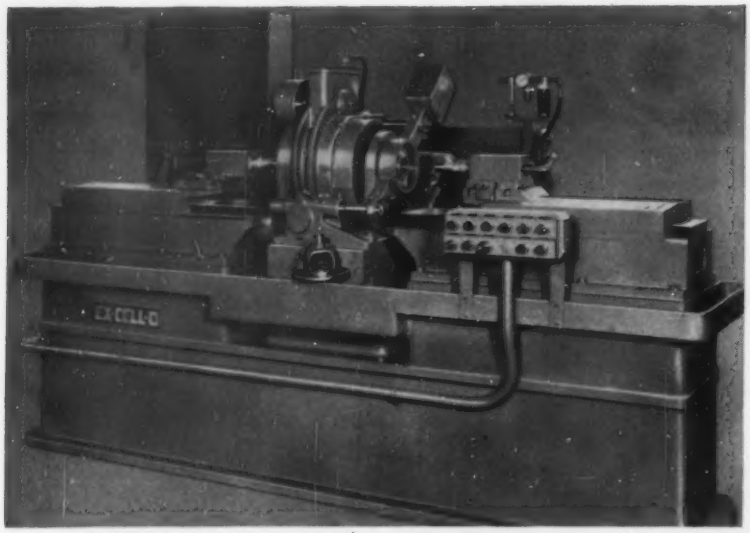
OIL PUMPS—*Douglas Tool Co, 2300 E Nine Mile Rd, Hazel Park, Mich.* Semi-automatic, eight-station machine assembles 280 oil pumps per hour. Operator places gasket, inserts idler gear, drive shaft, and gear assembly.



AUTOMOTIVE DIFFERENTIAL CASES—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Machine performs back-counterboring operations, eliminates handling of cutter before and after each cut. Parts are loaded manually and clamped hydraulically.

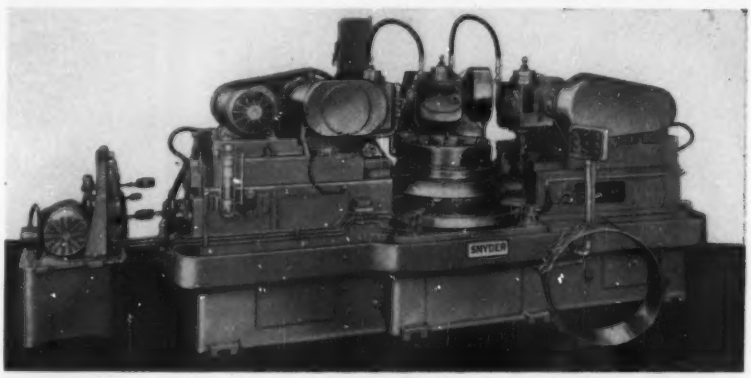
MAGNESIUM SUPERCHARGER — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Style 17 machine tooled to bore seven holes in one cycle at rate of 27 parts per hr. Diameters are held to ±0.0005 and relative location to ±0.001 in.

ENGINE OIL PANS—*Snyder Tool & Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Machine bores and faces handhole openings in welded-steel oil pans for large diesel engines. Uses hydraulic feed and indexing. Operator has choice of manual or automatic operation. Feed rate of spindle is 1.6 ipm for boring, 0.8 ipm for facing; corresponding spindle speeds are 80 and 40 rpm.

LANDING-GEAR CYLINDERS—*Snyder Tool & Engineering Co. 3400 E Lafayette, Detroit 7, Mich.* Double-end machine does rough- and finish-machining. Two trunnion ends are hollow-milled and centered and two cylinder ends are bored, faced, and centered. Each unit is controlled separately and work cycle is automatic. Eight spindle speeds vary from 43 to 416 rpm; max stroke is 30 in.; feed rates, ½ to 30 ipm.

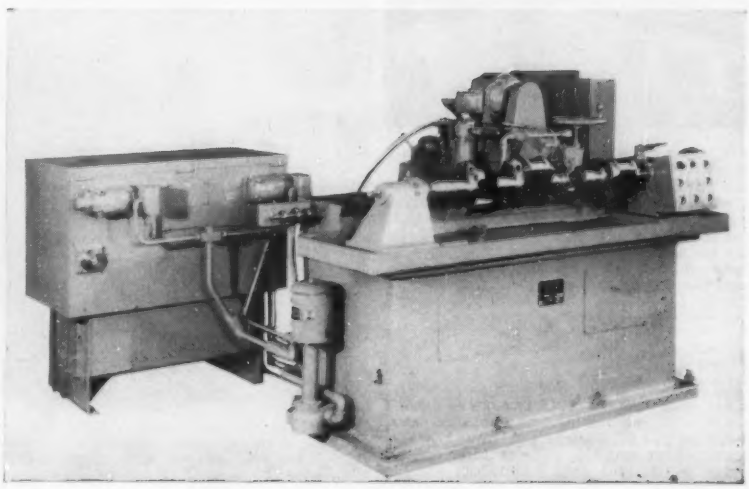
COMPRESSOR CASINGS — *Snyder Tool & Engineering So, 3400 E Lafayette, Detroit 7, Mich.* Machine consists of fixture mounted on rotary table driven by hydraulic motor; spaced around table are three milling units, each controlled by Turchan follower hydraulic system. Operation is to profile four rows of lugs projecting from outside of thin-walled cylinder of stainless steel on jet engine compressor casings. Work is done in two rough and one finish cuts.

ALUMINUM-ALLOY PISTONS — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 6, Mich.* Machine grooves, semi-finish, and finish-bores three pistons each cycle at production rate of 221 pieces per hr. Pushbutton controls, hydraulically operated fixture, and three spindles at each end.



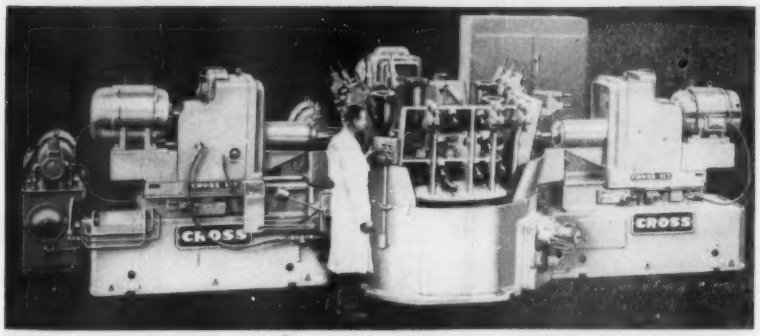
JET CASTINGS—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Double-end boring machine does boring job at both ends of central hole in magnesium air-compressor inlet housings.

REFRIGERATION BLOCK—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Compressor-block cylinders and crank-bearing diameters are bored simultaneously in two-way machine with units joined to center section at 90° angle.



AIRCRAFT-ENGINE CRANKSHAFTS — *Moline Tool Co, Moline, Ill.* Semi-automatic machine drills, reams, and spotfaces holes in cheek. Machine MR136.

ENGINE CRANKCASES—*Moline Tool Co, Moline, Ill.* 56-spindle machine back-spotfaces two parallel lines of 25 holes each in pan rail face and 6 holes in accessory end of aluminum crankcase for internal combustion engines. Hydraulic feed cycle is automatic. Model MR 137.



BRAKE BANDS — *Gardner Machine Co, Beloit, Wis.* Double-spindle, 30-in. grinder has hydraulic head-closing attachment, hydraulically operated worktable, wet-grinding system, and rotating workholding fixture. Two parallel sides of brake bands are ground simultaneously with production rate of 30 to 40 per hr. Tolerances for parallelism are from 0.003 to 0.004 in.

REAR AXLE HOUSING — *Gardner Machine Co, Beloit, Wis.* Double spindle grinder operates hydraulically. Production averages 30 per hour, removing 0.020 in. stock, maintaining tolerance of 0.015-in. flatness.

TANK SUSPENSION HOUSINGS — *The Cross Co, Detroit 7, Mich.* Drills and reams parts held on motor-driven index table with 4-in.-dia holes at rate of 11 pieces per hour.

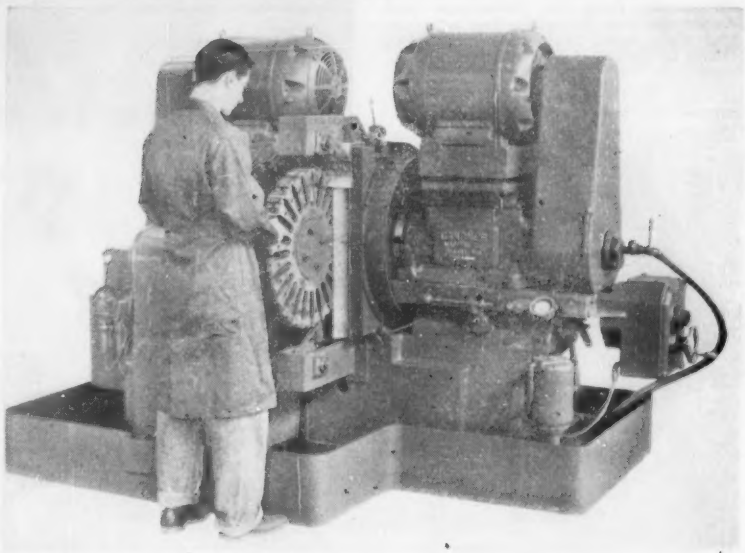
CONNECTING RODS—*The Cross Co, Detroit 7, Mich.* Five-station machine drills and mills 600 automotive connecting rods per hr. Index table is motor-driven; workholding fixtures are hydaulically operated.

TAIL PIPE PADS—*The Cross Co, Detroit 7, Mich.* Machine does milling, boring, drilling, chamfering, and tapping on exhaust manifold tailpipe pads for 6-cyl engines. Production rate is 120 parts per hr.

INTAKE MANIFOLDS — *The Cross Co, Detroit 7, Mich.* Seven-station Transfer-Matic performs 54 operations with production rate of 218 per hr. Two parts are simultaneously machined at each station.

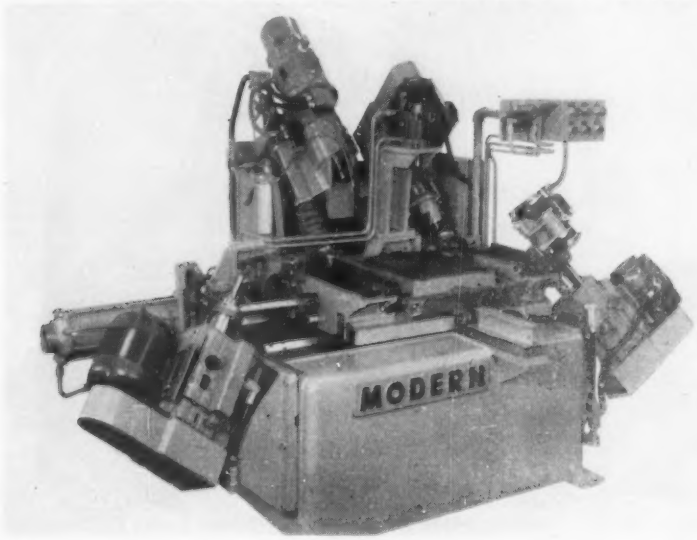
LOCOMOTIVE CYLINDER HEADS—*The Cross Co, Detroit 7, Mich.* Machine drills and reams Diesel parts in seven stations at rate of 50 per hr. Fluid motor-driven index table; hydraulic feed; rapid traverse; automatic lubrication.

TRACTOR CYLINDER BLOCKS — *The Cross Co, Detroit 7, Mich.* 22-station Transfer-matic performs 188 operations at rate of 72 parts per hr.



ALNICO MAGNET ENDS — *Gardner Machine Co, Beloit, Wis.* Horizontal-spindle, 26-in. grinder grinds ends of magnets at rate of 25 per hr with flatness accuracy ranging from 0.0003 to 0.001 in. Hydraulic cylinder holds head against micrometer-adjusted stop. Hydraulically operated worktable has 15x 18-in. working surface with T-slots.

TURBINE BLADES — *Gardner Machine Co, Beloit, Wis.* Double-spindle grinder rough grinds parallel ends prior to hardness testing at production rate of from 20 to 25 parts per min. Blades are manually loaded and automatically reloaded.



SINKS AND LAVATORIES—*Gardner Machine Co, Beloit, Wis.* Machine has conveyor carrying units past grinding wheel at 8 to 24 fpm. Abrasive disk is 3 in. thick, has 36-in. dia. No. 836.

TRACTOR CYLINDER BLOCKS — *The Cross Company, Detroit 7, Mich.* Transfer-matic has 13 stations to perform drilling, reaming, counterboring, tapping, and milling operations. Produces 71 parts per hr.

INSULATOR BASES — *Gardner Machine Co, Beloit, Wis.* Machine grinds two parallel surfaces of insulators and one surface of trimmer bases with accuracy of 0.0005 in. and production rate of 60 parts per min. Each head slide has handwheel and feedscrew mechanism for raising and lowering heads.

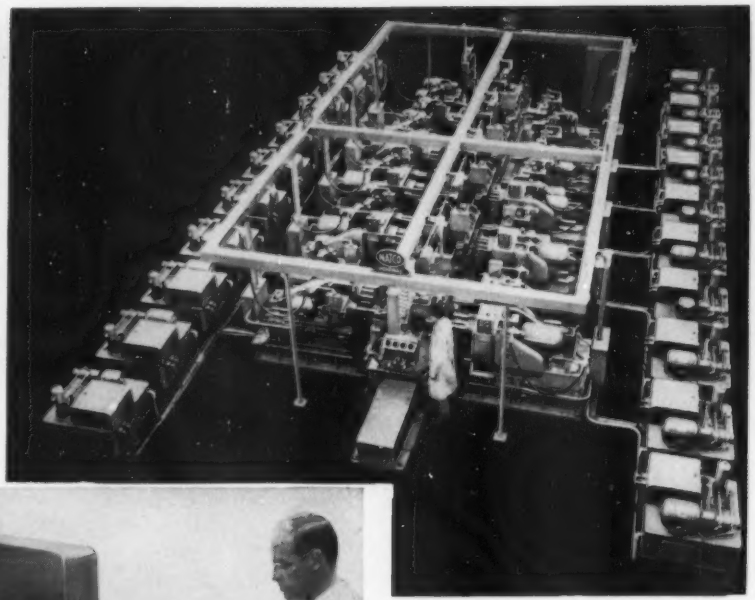
ENGINE CYLINDER BLOCKS—*Modern Industrial Engineering Co, Detroit 4, Mich.* Machine handling 55 parts per hr drills and taps oil holes at compound angles.

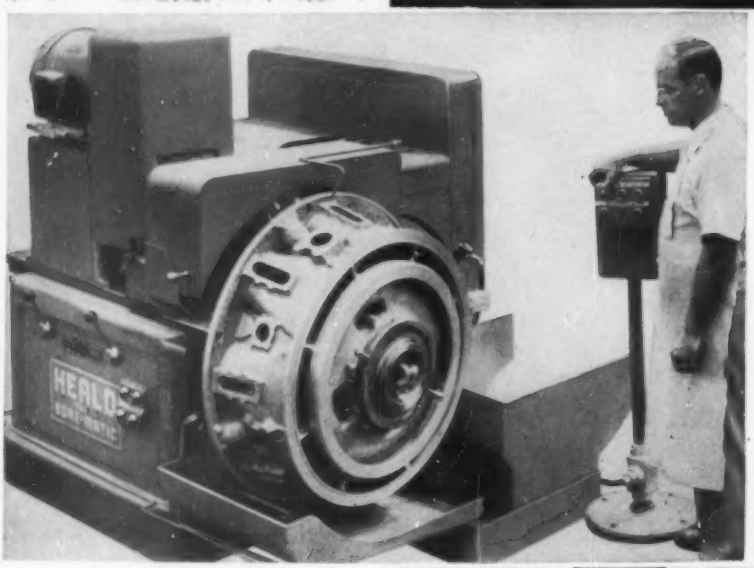
SPECIAL MACHINES

ENGINE BLOCKS — *National Automatic Tool Co, Inc, Richmond, Ind.* Automatic processing machine uses mobile hydraulic power units to complete 102 operations on each engine block in 0.6 min.

TRACTOR TRACK ROLLERS — *National Automatic Tool Co, Inc, Richmond, Ind.* Machine loads, drills, countersinks, taps, and unloads parts. Automatic indexing positions parts for various operations. Production rate is 72 parts per hr.

TANK CASE PARTS — *The National Automatic Tool Co, Richmond, Ind.* Automatic machine drills and taps left- and right-hand tank case parts. Machine is operated by one man.

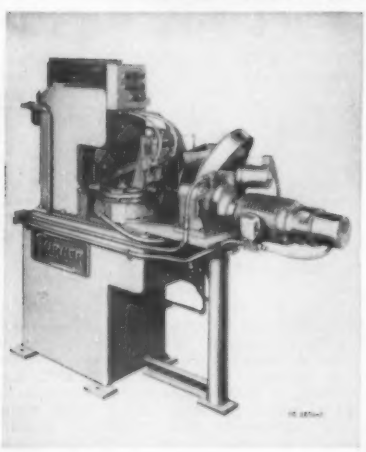


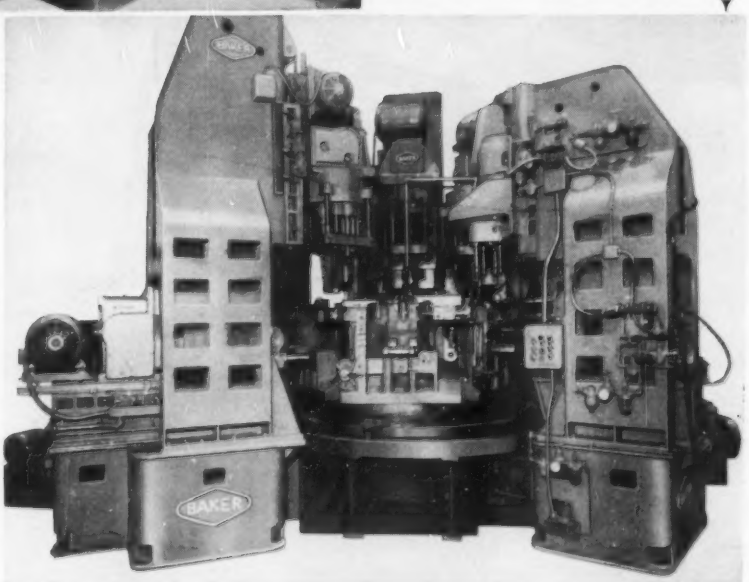


JET ENGINE—*The Heald Machine Co, Worcester 6, Mass.* Forty borizing operations are performed on each part at production rate of 12 min per part. Vertical indexing; eight stations; interlocked table. Bore-Matic No. 331.

ENGINE BLOCKS — *National Automatic Tool Co, Richmond, Ind.* 19-station machine requires one operator to perform 55 operations, including inspection at rate of two ppm.

CLUTCH HOUSINGS—*Baker Brothers, Inc, 1000 Post St, Toledo, Ohio.* Drills, chamfers, counterbores, and taps parts at 80 per hr rate. 72-in., six-station power indexing table.





BREATHER NUTS—*Turner Bros, Inc, 2625 Hilton Rd, Ferndale, Mich.* Automatic machine loads breather nut, inserts and crimps baffle, drills and automatically ejects nut.

FYI — FOR YOUR INFORMATION

FREE Catalogs, Booklets, Charts, Calculators

FYI—these initials symbolize information that's important. And there is much of importance in the literature listed here. To get the ones you need, all you do is fill out one coupon for each booklet you wish to order. Indicate in the circle on the coupon the number of one catalog wanted. When you have filled out a card, detach, stamp, and mail. We'll do the rest.

MACHINES AND ATTACHMENTS

1 GRINDERS — *Landis Tool Co, Waynesboro, Pa.* 20-page illustrated catalog F-53 describes 18- and 24-in. plain and roll units. Includes sketches and complete specifications.

2 POWER SHEARS—*Cleveland Crane & Engrg Co, Wickliffe, Ohio.* Illustrated catalog 2011-E covers Steelweld pivoted-blade shears. Dimensions and specifications given for 31 sizes ranging from 6 ft by 10 gage to 12 ft by 1-in. capacity.

3 HYDRAULIC PRESSES & EQUIPMENT—*R D Wood Co, Philadelphia 5, Pa.* 11-page illustrated brochure contains basic press specifications in addition to high-pressure hydraulic valves, accumulators, and shock alleviators.

4 HORIZONTAL DOUBLE-END MACHINES—*Walter P Hill, Inc, Detroit 19, Mich.* 2-page catalog sheet illustrates and describes units to bore, chamfer, burr, mill, center, flare, spin, tubular and solid metal parts at rates up to 6000 pieces per hr. Operating and application data included.

5 DRILLING MACHINE — *Hamilton Tool Co, Hamilton, Ohio.* 4-page bulletin V-53 illustrates Varimatic, supersensitive, small hole drilling unit. Includes operating data, diagram, and specifications.

6 BROACHING MACHINES—*Colonial Broach Co, Detroit 13, Mich.* 4-page condensed catalog 877 contains illustrated data on 12 basic types for varied applications. Broach sharpeners discussed. Numbers of bulletins providing additional information on each machine included.

7 PRESSES—*Lake Erie Engrg Corp, Buffalo 17, NY.* 16-page illustrated sectionalized bulletin 10.1 covers hydraulic bending, straightening, and plate-forming units. Gap-type, traveling head, column and side-plate units, and special designs described.

8 STRAIGHTENERS — *Sutton Engrg Co, Bellefonte, Pa.* 8-page bulletin 25 describes varied line of equipment for different applications. Photographs of 5-roll and 7-roll units provide additional detail.

9 PEDESTAL TOOL GRINDERS — *South Bend Lathe, South Bend, Ind.* 4-page illustrated catalog 5328 describes 8- and 10-in. wheel units providing extra working room because motor is mounted inside pedestal. Design improvements and specifications included.

TOOLS AND ACCESSORIES

10 RESEARCH & CONTROL INSTRUMENTS—*North American Philips Co, Research & Control Instruments Div, Mount Vernon, NY.* 64-page reference book includes data on X-ray and analytical equipment, electron microscopes, applications, and charts.

11 THERMOCOUPLES & ACCESSORIES—*Foxboro Co, Foxboro, Mass.* 36-page bulletin 235-5 lists, with specifications, standard units for all applicable temp ranges. Illustrations, dimensional drawings, installation diagrams, supplies and accessories.

12 SHEAR & SLITTER KNIVES — *American Shear Knife Co, Homestead, Pa.* 72-page leather-bound handbook contains all basic information on use and maintenance. Applications and operations illustrated. Request on company letterhead.

13 SPROCKET-RATIO CALCULATOR —*Wittek Mfg Co, Chicago 32, Ill.* Slide rule calculator determines at a glance correct ratio for use on chain drive for Wittek automatic roll feed for punch presses. Other side determines weights of metal pieces, using length, width, and thickness of piece and material factor from table.

14 COLLETS & CHUCKS — *Rivett Lathe & Grinder, Inc, Boston, Mass.* Bulletin 100E contains all data and specifications grouped conveniently for quick reference.

15 LONG-SCALE SWITCHBOARD INSTRUMENTS—*General Electric Co, Schenectady 5, NY.* 24-page bulletin GEC-218C illustrates and describes AB-DB-18 and AB-DB-16 instrument lines; principles of operation, characteristics, specifications, prices, dimensions provided.

16 BRITISH - AMERICAN UNIFIED THREAD MANUAL — *Besly-Welles Corp, Beloit, Wis.* Tap reference booklet contains latest data on standards for internal threading, including tabulated comparison. Includes information on tap-drill sizes, selection, feeding speeds, terms, and definitions. Request on company letterhead.

17 CARBIDE REAMER SHARPENING —*Staples Tool Co, Cincinnati 25, Ohio.* Shop manual on conditioning contains special sharpening techniques for specific applications; setups illustrated. Includes

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Company .....
Co. Address .....
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AMERICAN MACHINIST, New York *Not good after* **Mar. 18, 1954**

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FYI
FOR YOUR INFORMATION

data on recommended diamond wheel type and sizes, and tabulation of sharpening for reaming most materials.

18 MAGNETIC CHUCKS — *Taft-Peirce Mfg Co, Woonsocket, RI.* 14-page revised catalog 411 covers entire line. Sizes, specifications, prices included, as well as general information on applications and advantages.

HEAT TREATING AND WELDING

19 ELECTRONIC TEMPERATURE CONTROLLER—*Minneapolis-Honeywell Regulator Co, Philadelphia 44, Pa.* 9-page bulletin P-811 covers new 077 model with range extended to cover —100 to + 600 F. Specifications, prices, applications, as well as data on resistance thermometer elements and wells.

20 ARC WELDING EQUIPMENT — *Tweco Products Co, Wichita, Kans.* 12-page catalog, Tweco-log 9, covers line of electrode holders, ground clamps, cable connectors and accessories.

21 BRONZE ELECTRODE & FILLER ROD WELDING—*Ampco Metal, Inc, Milwaukee 46, Wis.* 24-page bulletin W-17 describes complete line for use with metal-arc, carbon-arc, inert-gas tungsten-arc, submerged-arc, and inert-gas consumable electrode processes. Includes technical information, procedures, and charts.

PLANT SERVICE EQUIPMENT

22 UNISORB MOUNTING PADS — *Fetters Co, Unisorb Dept, Boston 11, Mass.* 8-page booklet describes use in machine installation, with elimination of bolts, reduction of transmitted machine vibration, relative cost of method.

23 FIRE PUMPS—*Worthington Corp, Harrison, NJ.* Bulletin W-459-B42 illustrates and describes vertical turbine pumps providing adequate independent water supply. Adaptable to variety of drives, requires no priming, takes minimum floor space, avoids need for long suction lines.

24 CONVEYING EQUIPMENT — *Rapids-Standard Co, Inc, Grand Rapids 2, Mich.* 16-page illustrated catalog GC-53 covers complete line of portable and permanent belt units, gravity wheel and roller conveyors, in steel and aluminum, and casters and hand trucks for wide range of jobs.

25 METAL NAMEPLATES — *North Shore Nameplate Co, Bayside, LI, NY.* Illustrated brochure on Speedy-Cals; can be fastened to curved as well as flat surfaces without drilled holes.

26 PLANT MODERNIZATION & EXPANSION — *Walter Kidde Constructors, New York 6, NY.* 16-page brochure outlines step-by-step procedure for analyzing existing facilities and arrival at basic cost of proposed modernization.

27 WET BLASTING—*American Wheelabrator & Equipment Corp, Mishawaka, Ind.* Illustrated bulletin 93 gives description, specifications, of Model 30 Liquamatte machine for cleaning and finishing operations involving small parts.

28 SELF-FILTERING HOOD FOR BUFFING WHEELS — *Sinnoger Products Co, Dayton 4, Ohio.* Booklet illustrates Elim-O-Dust unit by which dust is withdrawn and controlled by wind created by revolving wheel or belt. Design, operating, and applications features included.

29 METAL TURNINGS SHREDDER—*Gruendler Crusher & Pulverizer Co, St Louis 6, Mo.* 4-page folder illustrates unit to shred, grind, and reduce stringy and curly steel and alloy scrap into 1-in. shavings for disposal, or ¼-in. shavings for briquetting. Specifications and diagrams included.

30 PUMPS—*Milton Roy Co, Philadelphia 18, Pa.* 16-page illustrated bulletin 1053 covers air-powered controlled volume units for low-capacity flow control problems. Contains operating principles, capacity-pressure, and air consumption tables.

PARTS AND MATERIALS

31 BRONZES—*International Nickel Co, New York 5, NY.* 12-page bulletin A107-8 provides tables, charts, illustrations and data on line of low-shrinkage, heat-treatable bronzes for machine component pressure and bearings castings that develop excellent mechanical properties in the "as cast" condition. Typical compositions and applications given.

32 DIAPHRAGM MOTOR VALVES — *Minneapolis-Honeywell Regulator Co, Philadelphia 44, Pa.* 12-page bulletin 362 describes low-cost line for on-off or narrow band proportional control. Specifications given for type 26 single seated and type 27 Bellows sealed valves.

33 FLUID POWER EQUIPMENT — *Oilgear Co, Milwaukee 4, Wis.* 12-page bulletin 10051-C illustrates and describes line of pumps, motors, transmissions, cylinders, and valves.

34 METAL HOSE — *Flexonics Corp, Maywood, Ill.* 32-page illustrated catalog 130R covers full line of Flexon hose, including new Rex-Flex heavy-duty stainless steel. Coupling types and installation data provided.

35 GEARMOTORS—*Westinghouse Electric Corp, Pittsburgh 30, Pa.* 15-page booklet B-5645 describes Life-Line models. Gear ratios for single, double, and triple reduction types given. Gearmotor designs developed especially for specific requirements described.

36 LIQUID-LEVEL & AIR-FLOW DETECTOR — *Fenwal Inc, Ashland, Mass.* 16-page illustrated booklet describes Detect-A-Flo unit. Application data, operation principle, specifications, electrical characteristics of device under various conditions of use included.

37 STRIP METALS—*American Silver Co, Industrial Div, Flushing 54, NY.* 6-page illustrated brochure describes source for wide variety of thin gage, close tolerances, ferrous, non-ferrous, and precious strip metals. Includes list of thickness tolerances held on beryllium copper strip gages.

38 SPEED REDUCERS — *Philadelphia Gear Works, Philadelphia 34, Pa.* 16-page catalog P-53 describes improved Planetary in-line reduction units; standard ratios range from 4.3 to 1, to 106 to 1. Construction details, diagrams, and selection tables.

39 FASTENERS — *Southco Div, South Chester Corp, Philadelphia 3, Pa.* 24-page illustrated catalog 52 describes seven types with tables of dimensions and size.

40 SILICON CARBIDE — *Carborundum Co, Niagara Falls, NY.* 52-page brochure treats of properties as related to applications such as resistors, electric heating elements, catalyst carriers, as well as abrasive applications. Manufacturing techniques and bibliography included.

41 AIR & HYDRAULIC CYLINDERS —*Lindberg Engrg Co, Air Hydraulic Div, Chicago 7, Ill.* Bulletin 800 describes complete line of heavy-duty units with features of each.

42 ALLOY STEEL SCREWS — *Strong, Carlisle & Hammond Co, Mac-it Screw Div, Cleveland 13, Ohio.* 17-page technical folder illustrates and describes line, with suggested applications.

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American Machinist
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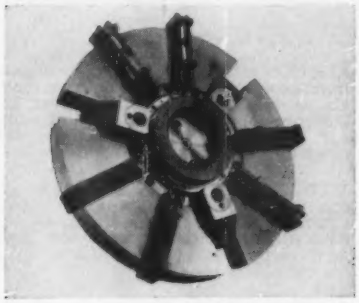
1954 AMERICAN PRODUCTION AND MACHINE TOOL REVIEW

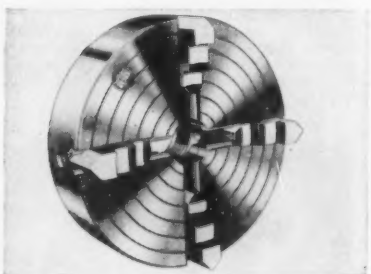
TOOLS AND ACCESSORIES

summarized from descriptions published during 1953



CHUCK—*Cushman Chuck Co, Hartford 2, Conn.* Designed for operation without distortion, strain, at high speeds. For manual or air-power chucking on repetitive machining operations.

DIAPHRAGM CHUCK—*Sheffer Collet Co, Traverse City, Mich.* Employs compact booster mechanism within self-contained air cylinder said to develop thrust many times greater than conventional cylinder of equal size.



CHUCK—*Westcott Chuck Co, Oneida, NY.* 8-in. four-jaw independent chuck for direct-mounting lathes, milling machines, and grinders. No adapter is required. No. 5909.

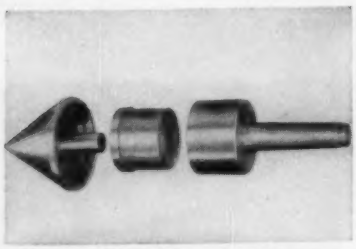
CHUCK—*Buck Tool Co, Kalamazoo, Mich.* Designed for 0.0005-in. precision within one minute on original chucking. Holds work up to 8 in. in dia.

CHUCKS—*E Horton & Son Co, Windsor Locks, Conn.* For jet-engine machining. Produced for shroud rings, rotor compressor disks, and other thin-walled sections.

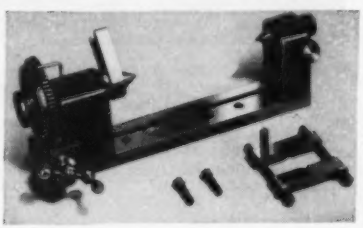
LIVE CENTER—*Bultool Co, Box 5094, Southfield Station, Detroit 35, Mich.* Spring-loaded tool features pre-loaded journal bearings. HSS point is said to maintain concentricity of 0.0003 in.

LIVE CENTER—*Royal Products, 82 Union St, Mineola, NY.* Guaranteed accuracy is 0.0001 in. Equipped with No. 3 Timken bearings. Interchangeable points are available in a wide variety of sizes.

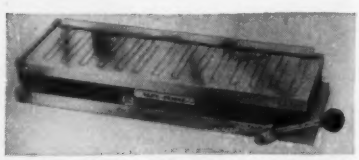
WORK DRIVERS—*Skinner Chuck Co, 95 Edgwood Ave, New Britain, Conn.* Lathe work driver consists of three or six eccentric jaws with floating spring action. Five sizes provide work-dia capacity ranging from ½ to 1-7/16 in. up to size ranging from 4⅞ to 8-1/16 in.



LIVE CENTER—*J G Jergens Co, 11106 Avon Avenue, Cleveland, Ohio.* Said to allow use of carbide tools in older equipment and withstand heavy thrust loads while maintaining extreme precision. No. 4 Morse taper shank and 4-in. ID capacity nose.



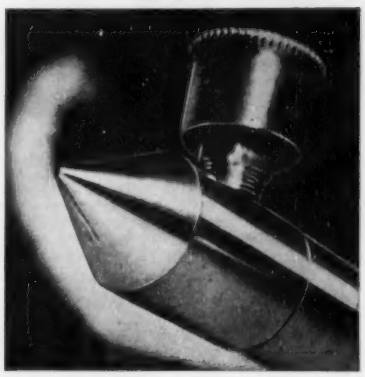
INDEXING CENTERS—*South Bend Lathe, South Bend 22, Ind.* Take stock to 5-in. dia and 6-in. length. Ball crank and worm gear turn head center. Each graduation indicates center movement of 3 min.



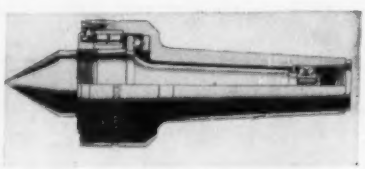
MAGNETIC CHUCKS — *The Taft-Peirce Mfg Co, Woonsocket, RI.* Now 15% lower in height. More magnetic poles make possible a greater effective work area. Holding power is controlled by hand lever.

MAGNETIC CHUCK — *Sundstrand Magnetic Products Co, Div of Sundstrand Machine Tool Co, Rockford, Ill.* Multiple poles for full work-surface holding area. All joints are silver brazed.

POT MAGNETS — *Aronson Machine Co, Arcade, NY.* Round model has pull of 275 lb and 4-in. dia. Cube model has 375 lb pull and is 3¾ in. on each side. Price: $70 and $75.



LATHE CENTER—*Tool Service, PO Box 10265, Palma Ceia, Tampa 9, Fla.* Incorporates oil-jet (0.040-in. dia) and grease cup. Points are 60°, tipped full length with HSS or cast alloy.



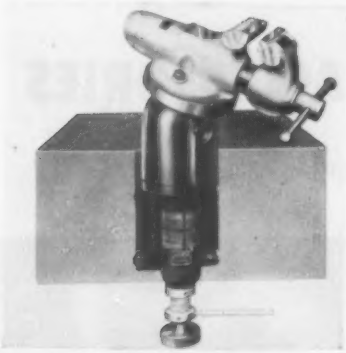
LIVE CENTER—*Ready Tool Co, 554 Iranistan Ave, Bridgeport 5, Conn.* Designed for heavy-duty work; two double-row bearings provide support; sealed-in lubrication. Type SKF.

SPINNING CENTER—*Ready Tool Co, 554 Iranistan Ave, Bridgeport 5, Conn.* Uses two radial bearings with ball thrust bearing in the center. Said to maintain safe handling temperature at speeds over 10,000 rpm.

SHANK CENTER — *Ready Tool Co, 554 Iranistan Ave, Bridgeport, Conn.* Morse tapers from No. 1 to No. 5. Anti-friction single-row angular-contact bearings in duplex. HSS point is replaceable. Price: $26 to $75.

LONG-POINT CENTERS — *Ready Tool Co, 554 Iranistan Ave, Bridgeport 5, Conn.* Designed to provide perfect balance as well as accurate support under extreme loads and speeds in external honing operations. Locked-in duplex angular-contact bearings are self-lubricated. Labyrinth seal prevents entrance of dirt.

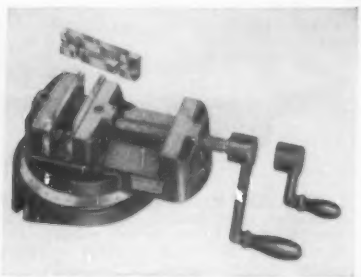
CUTTER GRINDER DOG — *Ready Tool Company, 554 Iranistan Ave, Bridgeport 5, Conn.* Readily adjusts to different diameters of work. Construction permits getting close to face plates.



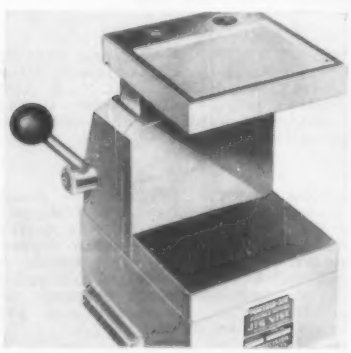
POWER ARM—*Wilton Tool Mfg Co, 925-941 Wrightwood Ave, Chicago 14, Ill.* Heavy-duty hydraulic unit has slotted base for use with drillpresses, shapers, and milling machines. Hydraulic action makes it possible to change position of work while under partial tension. Carrying capacity is 1000 lb.

VISE JAW FACES—*Columbian Vise & Manufacturing Co, Cleveland, Ohio.* Of hardened steel or copper. Special faces are designed to fit irregular pieces.

VISE FACE PLATES—*The Kenimar Corp, Greenwich, Conn.* Protects finish materials from marring. Fit any standard vise up to 6 in.; fastened by setscrew.



MILLING VISES—*Kenco Manufacturing Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* Now in 6-in. model. Graduations run from 0 to 90 to 0 at 45° angle for easy reading. Equipment includes three hard-face jaw plates.

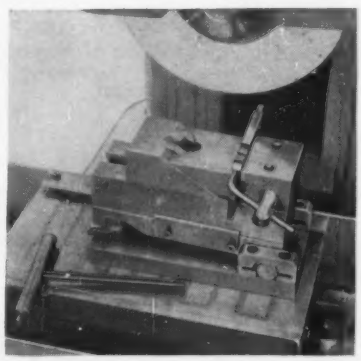


JIG-VISE—*SuPrecision Products, 2447 Nicollet Ave, Minneapolis 4, Minn.* Air-powered; clamping pressure ten times airline pressure. Permits handling thin-walled plastics as well as heavy structural members.

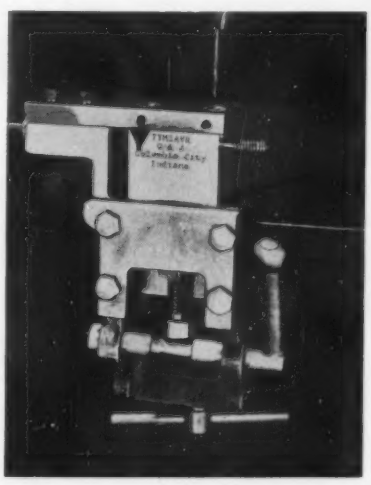
BENCH VISE—*Flexivise Co, 1149 East Pico Blvd, Los Angeles, Calif.* Entire assembly, as well as vise itself, rotates through 360°. Sleeve attachment provides endless positioning range. Jaw opening is 5½ in.

CLAMPING VISE—*Brown Engineering Co, Reading 2, Pa.* Rear turret revolves, presenting four different faces for holding various kinds of work. Auxiliary jaws at top of each turret can be spread at an angle.

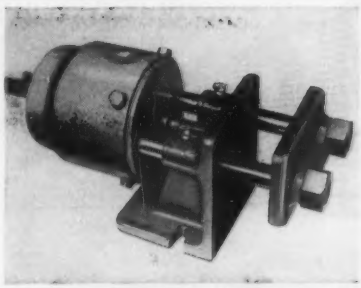
VISE JAWS—*Wilton Tool Mfg Co, 925-941 Wrightwood Ave, Chicago 14, Ill.* Line of replaceable jaws includes jaws made of hardened steel with diamond serrations, smooth, hard, or soft steel, smooth brass, smooth copper, and plastic fiber.



GRINDING VISE—*J & S Tool Co, 644 W Mt Pleasant Ave, Livingston, NJ* Square in four positions within 0.0001 in. in 1 in. Features adjustable stop and down-holding clamping action. Holds round stock from 1/16- to 2½-in. dia in V-block fashion. Range of jaw openings is 0 to 3 in.



WORK HOLDING FIXTURE—*C & J Screw Machine Products, Inc, Columbia City, Ind.* For cross-drill operations; attaches to swing table of ordinary drillpress. Two drill hole positions in bushing plate accommodate bushings to ⅜-in. drill hole size.



AIR-CONTROLLED VISE — *Wilson Bohannan Co, Marion, Ohio.* Two models provide power factor of 8 or 11; designed for use on most machine tools. Air cylinder and stationary jaw are placed on same side of work.

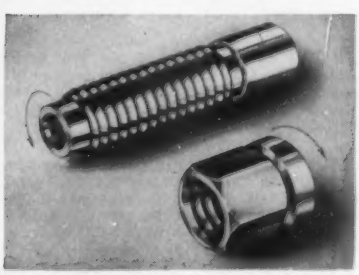
MACHINE VISES—*Wilton Tool Manufacturing Co, 925-941 Wrightwood Ave, Chicago, Ill.* Jaw widths are 3, 4½, or 6 in. All sides are fully machined. Jaws have vertical and horizontal V-grooves for clamping rounds.

SAFETY VISE—*Wahlstrom Float-Lock Sales Dept, American Machine & Foundry Co, 511 Fifth Ave, New York 17, NY.* Ratchet jaw designed for fast setups on production pieces. Locks securely by ¼-turn of T-handle. Available with 9- or 12-in. jaw opening.

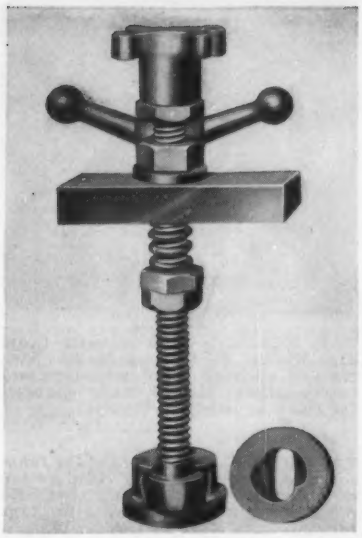
MACHINE TOOL VISE—*J & S Tool Co, Inc, 644 W Mt Pleasant Ave, Livingston, NJ.* Double half-vise for jig borers, millers, planers, and shapers permits loading and unloading by loosening one adjusting screw.

EXPANDING MANDREL—*Le Count Tool Works, 90 Capitol Ave, Hartford, Conn.* Eleven sizes accommodate every size bore from ⅜ to 7 in. Work is held by three keys sliding in grooves on 3° taper.

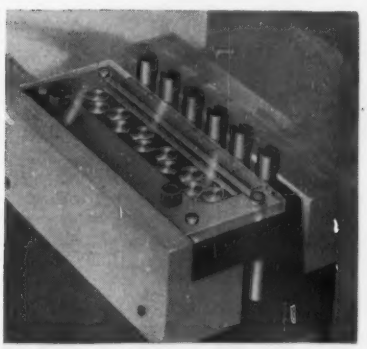
MACHINE SET-UP KIT — *Jergens Tool Specialty Co, 712 E 163 St, Cleveland 10, Ohio.* Contains 24 studs, 4 extension nut couplers, 4 flange nuts, 4 T-slot nuts, and 4 strap clamps.



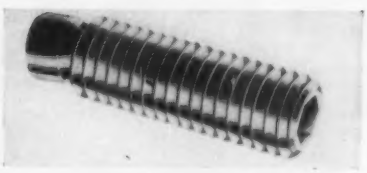
SWIVEL SHOE SET—*Allied Air Parts, 662 N Robertson Blvd, Los Angeles 46, Calif.* Adaptable to any tool or jig; positive holding without marring part. Types for hexagon or socket head.



CASTING CLAMP — *Morton Machine Works, 2421 Wolcott St, Detroit 20, Mich.* Assembly clamps casting on to pilot plate through bored hole. T-bolt can be cut off to suit any job height.



MULTIPLE CLAMP—*Design Aids Co, North 7th St, Newark 7, NJ.* Clamps up to ten parts simultaneously by automatically compensating for size differences. Can be applied to all types of vises for milling and grinding operations. Three types were designed for hard and soft metals and to compensate for surface irregularities on castings. Jaw widths range from ⅜ to 1½ in.

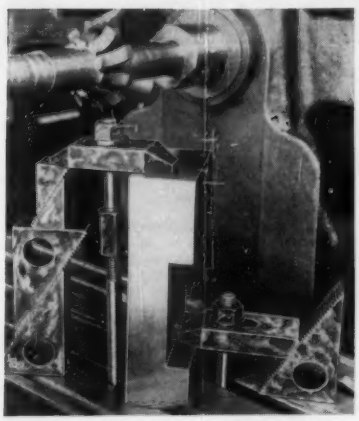


REST PAD—*Vlier Engineering, Inc, 4552 Beverly Blvd, Los Angeles 4, Calif.* Self-aligning clamp for jig and fixture work uses ball-bearing construction to allow clamp to automatically adjust itself to distribute uniform pressure.

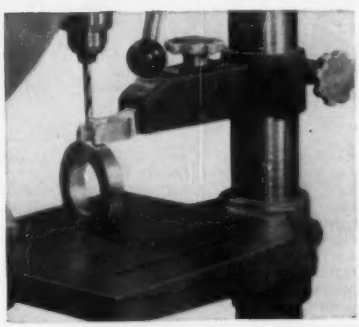
TOGGLE CLAMPS—*Lapeer Mfg Co, Lapeer, Mich.* Clamping range from 3-15/32 to 6-15/32 in. with throat capacity of 2¼ in.; 1-11/16 to 6-15/32 with throats from 1¼ to 2¼ in. Eight clamps: five with horizontal handles, three with vertical.

CLAMP—*Centinela Industrial Supply Co, 11930 Inglewood Ave, Hawthorne, Calif.* Throat depth is 5½ in. Said to apply straight-line force at point of clamping.

SELF-SETTING CLAMPS—*Alpha Tool & Supply Co, Closter, NJ.* For any work requiring solid gripping capacity. Sizes range from 3½ to 8 in. Price: $2 to $7.25.

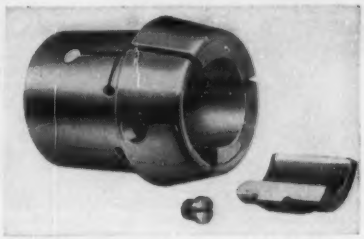


STRAP CLAMPS—*Northwestern Tool & Engineering Co, 17 Hollier Ave, Dayton 3, Ohio.* Beveled on nose for cutter clearance; lengths of 2½, 4, and 6 in. handle studs from ⅜ to ¾ in. in dia.

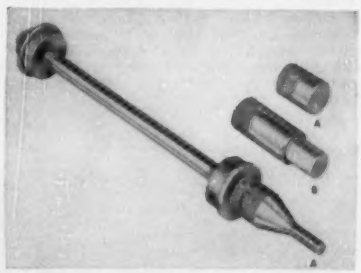


DRILLPRESS CLAMP—*Clark & Sawyer, Inc, 212 E Seventh St, Los Angeles 21, Calif.* Fits all models, holds objects of any shape. Distance of fork from column is adjustable from 7¼ in. to 8¼ in.

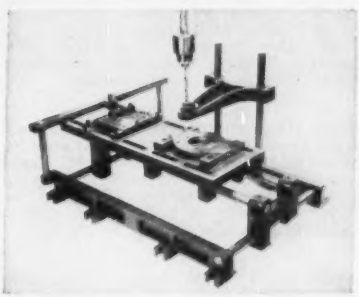
STANDARD JIG SHAPES — *Great Western Steel Co, Inc, 1011 E 61st St, Los Angeles 1, Calif.* Normalized cast iron. For use individually or as a group in jig and fixture building. Over 50 sizes in 18-in. lengths.



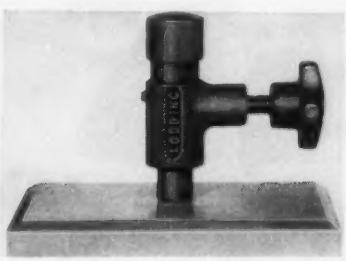
COLLET PADS—*Hall Manufacturing Co, 623 Tularosa Drive, Los Angeles 26, Calif.* Designed for use with Hall model B 2-in. chucks. Sizes range from 3/16 to 1-17/32 in. by 32nds.



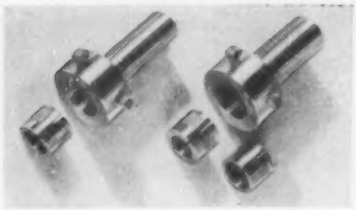
COLLET STOP—*Wade Tool Co, Waltham, Mass.* For fast, accurate second operation work. Required adjustments are made from rear end of spindle with screwdriver. Two solid pads and one spring pad are furnished.



HOLE-LOCATING DEVICE — *Honnef Engineering Co, Wethersfield, Conn.* For accurate production drilling. Handles work as large as 6¾x10 in. with work height limited by drillpress.

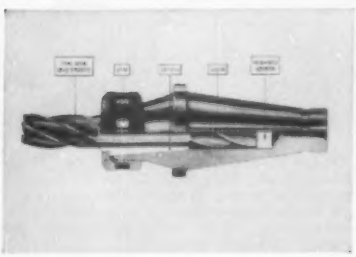


SPRING JACK—*Lodding, Inc, Dept N 63, 79 Beacon St, Worcester, Mass.* Plunger, actuated by spring, makes contact with work without requiring manual pressure. Button-base model, $9.00; flange base, $9.25.



TOOL ADAPTER—*American Cam Co, Hartford 1, Conn.* For B&S automatic screw machines; with two adapters No. 00 tools can be used on No. 0 machines and either No. 00 or No. 0 tools on No. 2 machines.

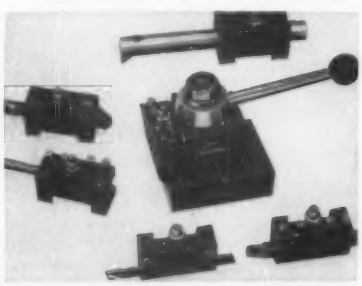
TURRET TOOLHOLDER—*Claremont Instrument Co, 7809 S Claremont Ave, Chicago 20, Ill.* Said to repeatedly index within 0.0005 in. of original setting. Safety cam handle; time saver for indexing; rocker arms for shim elimination.



COLLET CHUCK—*Victor Machinery Exchange, Inc, New York, NY.* Range of 48 models with capacity from ⅛ to 2 in. May be used in millers, drill-presses, grinders, lathes, and automatic screw machines. Swedish—B&V.

TOOLPOST TURRETS — *Olson Industrial Products Inc, 40 West Water St, Wakefield, Mass.* Square and hexagonal; provide for repetitive indexing in all twelve positions to 0.0003 in. Distance from top of lathe compound to centerline ranges from 1 to 2¾ in.

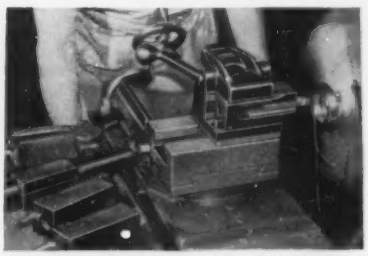
FLOATING HOLDERS — *Barnaby Manufacturing Co, 70 Knowlton St, Bridgeport, Conn.* Now finished with Du-Lite black for greater rust-resistance. Oil-absorptive properties reduce friction and prevent galling.



LATHE TOOLPOST—*Aloris Tool Co, Inc, 80-82 Fourth Ave, NY, NY.* With five interchangeable toolholders for turning, threading, drilling, cutoff, and boring. From ¼- to 1-in.-toolbit capacity and ¼- to 1½-in. boring bar capacity.

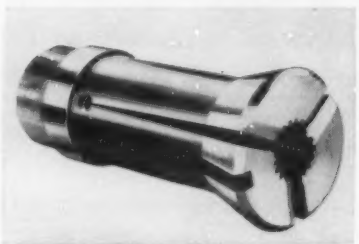
KEY-REEL — *Lummis Manufacturing Co, 2242 E Foothill Blvd, Pasadena 8, Calif.* Device for anchoring chuck key uses Swedish clock-spring mechanism and 24-in. steel chain. Price. $2.50.

ADAPTER NUT—*Hall Mfg Co, 622 Tularosa Dr, Los Angeles 26, Calif.* Adapts Hall model B-2 collet chuck to 1-00 taper spindle lathes. Price: $175.



TOOLPOST—*Bakewell Products, 1128 Mission St, South Pasadena, Calif.* Secured to lathe by T-block which fits into T-slot of compound. Bar-type toolholder is held in toolpost by hardened and ground jaws. One corner of toolholder is chamfered 45°.

TOOLHOLDER—*Brookfield Inc, 172 Newbury St, Boston 16, Mass.* Holds any shape tool from ⅛ to 1 in. Precision grinding reportedly assures shank and V-jaw section are parallel within 0.0005 in. in 6 in. Runout is less than 0.0001 in.

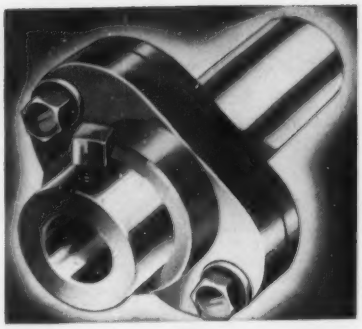


COLLET—*Sheffer Collet Co, Traverse City, Mich.* For use in rotating spindle. Designed with inclined plane on following edge of each slot face.

ARBORS AND CHUCKS—*Splinemaster Products Div, Great Lakes Broach, Inc, 2580 Groesbeck Highway, Roseville, Mich.* Pitch line concentricity units engineered for particular application. Said to be answer to machining and inspection problems where there must be close control of tolerances from spline pitch diameters to face, shoulders, bores, and external or internal pitch dimensions of gears.

TOOL SETTER—*Arnold C Gayne Associates, Inc, 670 State St, Bridgeport, Conn.* Designed to reduce placement time; held by permanent magnet. Three-point positioning legs allow for holder irregularities. Micro Pin.

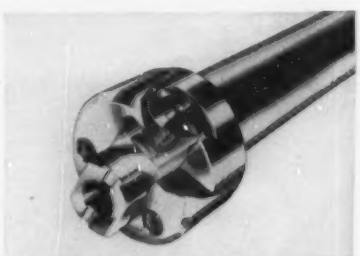
TOOLHOLDER—*Brookfield, Inc, 755 Boylston St, Boston 16, Mass.* Holds any dia from 1/16 to ¾ in.; shank and V-jaw sections are parallel within 0.0005 in. in 6 in. Model GA.



TAP HOLDER—*Boyar-Schultz Corp, 2110 Walnut St, Chicago 12, Ill.* Five sizes fit all hand screw machines and turret lathes. Holder easily changed for right- or left-hand tapping.

TAP CHUCK—*Ettco Tool Co, 594 Johnson Ave, Brooklyn 37, NY.* Centers tap on round of shank; floating jaws hold it on the square. Three sizes for taps ranging from No. 0 to 1 in.

END MILL ADAPTER—*Goddard & Goddard Co, 12280 Burt Rd, Detroit 23, Mich.* For No. 50 NS drive milling machines; holds 2-in. straight-shank end mills and shell end-mill arbors. Four bolt holes and key slots provide for rigid mounting.

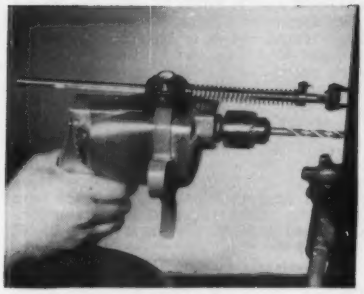


OFFSET BORING CHUCK — *Last Word Sales Co, 18500 N Elliot, Detroit, Mich.* Dial and micrometer screw allows precision adjustment of offset and accurate resetting. Available with any shank or adapter.

QUICK-CHANGE SPINDLE—*The Fosdick Machine Tool Co, Cincinnati, Ohio.* For Fosdick jig-borers and automatic positioning machines. Said to allow changing tools in less than ten sec with such accuracy that hole sizes can be repeated within ±0.0001 in. Straight-shank adapters are used to hold tools not provided with Beaver shanks.

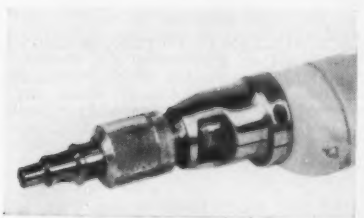
SPADE DRILL HOLDERS — *Waukesha Tool Co, Waukesha, Wis.* For use on large automatic screw and chucking machines. Cutting-dia sizes range from 1¼ to 3½ in. Holders use blades now supplied for deep-hole drilling operations.

LATHE TOOLBLOCK — *Marvic, Inc, 350 Peninsular Ave, San Mateo, Calif.* Four-faced toolblock and five basic toolholders. Said to permit faster tool changing and work closer to chuck or tailstock. Standard sizes accommodate lathe ranges from 10 to 26 in.



DRILL ATTACHMENT—*The Roy Silver Corp, 561 Bridgeport Ave, Devon, Conn.* Attaches to portable drill with leather strap and incorporates circular level and contact head calibrated in 5° divisions. Thus, position in vertical or horizontal plane is indicated. Price: $12.50. Guide-a-Drill.

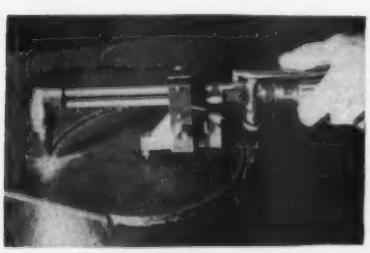
DRILL JIGS—*Zagar Tool, Inc, 24000 Lakeland Blvd, Cleveland 23, Ohio.* Self-clamping units for use with Zagar multiple-spindle drillheads. Four types handle hole patterns from 3 to 15 in. in dia.



DRILL GUIDE—*E & E Engineering Co, 15023 Harper Ave, Detroit 24, Mich.* Depth stop can be set to ¾ in. for hand tools and 1¼ in. when mounted on drillpress. Unit is made of aluminum and pilot is designed to take place of drill bushing. With outside chamfer, device may be used for centering holes in countersink.

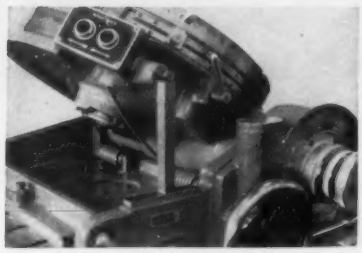
SELF-LOCKING CHUCKS — *Clarkson Inc, 320 Ontario St, Toledo, Ohio.* Autolock eleminates use of adapters; two models have capacity of 1/16 to ¾ and ⅞ to 1¾ in. Dedlock handles cutters from 2 to 6 in. British—Clarkson Ltd.

SPRING CENTER—*The Medelton Co, Inc, 225 E 142nd St, Bronx 54, NY.* Designed to tap holes squarely at same time the work is drilled; can be used on jig borers as well as lathes, vertical millers and drillpresses. Price $7.50.



FLAME-CUTTING GUIDE—*New Era Mfg Co, 458 W 29th St, Chicago 16, Ill.* Clamps onto steel plate to support gas-welding torch and aid in cutting straight lines and bevels. Guides for circles from 1 to 66 in.

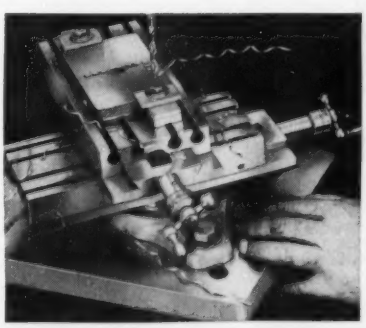
RATCHET INDEXER — *Durant Tool Supply Co, 155 Orange St, Providence 3, RI.* Can be mounted in place of conventional ratchet or friction clutch on power press roll feeds. With 2-in. dia rolls, will index to 0.006 in. Accurate feeding to 500 spm; 6720 stations. Price: $165.00.



ROTARY TABLE—*Pratt & Whitney Div, Niles-Bement-Pond Co, West Hartford 1, Conn.* 24-in. dia; combines power rotation with settings to 2 sec of arc; rotates 360° in any plane.

ROTARY DIVIDING TABLE—*International Machinery Div, British Industries Corp, 164 Duane St, New York, NY.* Said to be the thinnest made. Supplied with inspection certificate showing max error to be 0.00025. Sizes of 11- and 12-in. dia. British—Hayes Engineers.

REMOTE CONTROL TURNTABLE—*Gale Dorothea Mechanisms, Elmhurst, LI, NY.* Reversible and variable in speed from 0 to 20 rpm. Disk of 18-in. dia handles loads to 200 lb.



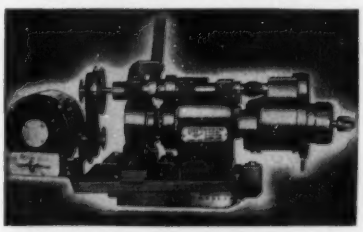
UNIVERSAL TABLE — *South Bend Lathe, South Bend 22, Indiana.* Accessory for combination angular and straight cuts on shapers, milling machines, and grinders. It spaces drilled holes on a drillpress and, by chucking an end mill, converts it to light miller. Two feedscrews are equipped with micrometer collars reading to 0.001 in.

TURRET INDEXING UNITS—*Swanson Tool & Machine Products, Inc, Erie, Pa.* Intermittent-motion type; provide basic unit for variety of special automatic machines. Turret diameters are 20, 30, and 40 in. for mounting 16, 24, or 32 work stations. Indexing rates are from 547 to 4700 indexes per hr and dwell time may vary from 0.5 to 4.9 sec.

DIAL FEED TABLES—*A K Allen Co, 57 Meserole Ave, Brooklyn 22, N. Y.* Designed so top plate cannot override and lose index under severe operating conditions. Two models have 4, 6, 8, 12, and 24 indexing positions. 11FA is priced at $325; 11FB has pilot timer and two-way valve for automatic operation and is priced at $365.

COIL STOCK FEEDER — *Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* For automatic feeding of all types of coiled stock; feeds loops at rate of 90 fpm. May be used with punch presses, slitters, forming rolls, and shears. Sizes for 10-, 13-, and 15-in. roll widths.

SMALL PARTS FEEDER—*Schlack Mfg Co, 24265 Middlebelt Rd, Farmington, Mich.* Provides single-file feeding to machining, assembling, or sorting equipment. Variable feeding rate is accomplished by regulating air pressure. Parts are dumped into 18-in.dia bowl and fed up spiral track. Price: $450.



GRINDING WORK FEEDER—*Detroit Reamer & Tool Co, 2830 E Seven Mile Rd, Detroit, Mich.* Motor-driven circularity grinding attachment simultaneously revolves work and moves it back and forth. Standard spacer gears with follower pin for each flute provide indexing for 2, 3, 4, 6, 8, or 12 flutes. Model 500.

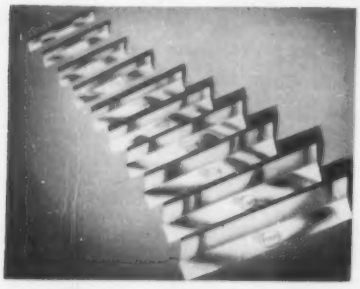
HITCH FEED—*H E Dickerman Mfg Co, 321 Albany St, Springfield, Mass.* Mounts on die set or attaches to bolster to feed from any direction. Feeds lengths to 2½ in. and max thickness of 0.031 in.

HYDRAULIC FEED — *JACO Devices, Inc, Hingham, Mass.* Coil and strip stock feed for punch press applications. Positive-displacement pump has handwheel control. Stock movement can be set to start or stop at any point in ram stroke. Model A handles material to 6 in. wide with 6-in. feed stroke; Model B handles material to 12 in. wide with 12-in. feed stroke.

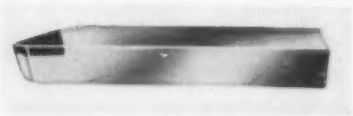
FEED MOUNTING ADAPTER—*H E Dickerman Manufacturing Co, 321 Albany St, Springfield, Mass.* For use with Rol-Di-Feed; consists of mounting base and feed-mounting member drilled and tapped to accommodate all sizes of feeds. Eliminates use of shims.

PUNCH PRESS FEEDER—*Affiliated Machine & Tool Co, 260 West St, New York 13, NY.* Feeds sheet stock with thickness from 0.001 to 0.125 in.

WORK POSITIONER—*All-State Welding Alloys Co, 249 Ferris Ave, White Plains, NY.* Available as bench or pedestal model with accessories to make it inclinable and operable intermittently. Load capacity is 300 lb.



TOOL BITS—*Besley Welles Corp, Beloit, Wis.* HSS; 10 sizes of squares from 3/16 to 1 in. with tolerance of 0.001 in. Said to have excellent resistance to abrasion and unusual toughness.



THREADING TOOL—*Super Tool Co, 21650 Hoover Rd, Detroit 13, Mich.* For 60° threading close to shoulder. Seven sizes with shank from 3/16 to ¾ in. Model ETS.

CLAMP-ON TOOL—*Wilson Mfg Co, Inc, Wichita Falls, Texas.* Carbide blanks are molded with 6° clearance angle on all four sides. Features include: tungsten carbide tip with four cutting edges, clamped-on tool will stand any temperature cutting tip will; adjustable clamp with brazed-on chip breaker. Square sizes are 1¼ or 1½ in. on a side; parallelogram shanks are 1x2 and 1x1½ in.

CARBIDE TOOLS — *Adamas Carbide Corp, Harrison, NJ.* Eleven styles with finished diamond-ground cutting edges. Silver-solder-brazed units have cold-drawn steel shanks and plastic-dipped cutting edges.

CEMENTED CARBIDE INSERTS — *Carboloy Dept, General Electric Co, Detroit, Mich.* Added sizes include ⅝-in.-dia. inscribed-circle triangular insert, 55° and 80° diamond-shaped insert, and ¾-in. square insert.

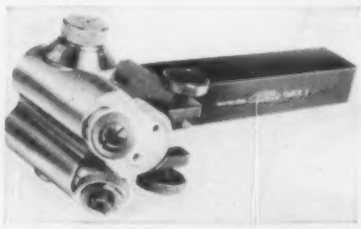
HIGH-SPEED TOOLBITS—*Plew Tool Co, Inc, Columbia City, Ind.* Steels are of high tensile strength and rate 64 to 66 Rc. Lucky 7 is vanadium steel; Tuf-Cut is molybdenum steel.

COUNTERBORE — *Metal Cutting Tools, Inc, 301 S Water St, Rockford, Ill.* Pin-drive carbide-tipped tool has back-up screw inserted from drive end and uses standard short pilot.

SHORT-SET COUNTERBORE—*Butterfield Division, Union Twist Drill Co, Derby Line, Vt.* Made with cutter and shank integral and with interchangeable pilots. Styles include long, short, set-in, straight, and taper shank.

THREAD TAPS — *Pratt & Whitney, Div Niles-Bement-Pond Co, West Hartford, Conn.* Pitch diameters are larger than standard commercial-ground series.

TOOLBITS—*The duMont Corp, Greenfield, Mass.* High-speed rectangular-ground toolbits composed of carbon and vanadium heat-treated to a hardness of 68 Rc.



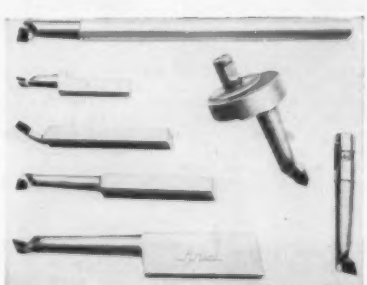
KNURL CUTTER—*Alina Corp, 401 Broadway, New York 13, NY.* Produces cross, diamond, and straight knurls of various pitches on cast iron, non-ferrous metals, and plastics with diameters from 1/16 in. to 10 ft. Cutter can knurl delicate thin-walled parts without internal support.

KNURLING TOOL—*Barnaby Mfg Co, 7½ Knowlton St, Bridgeport 8, Conn.* Said to be quickly setup for high-speed precision knurling behind shoulders or at any distance from end of work. Diameters from 1/16 to 1¼ in.

BORING BARS—*Belock Instrument Corp, 111-01 14th Ave, College Pt, Long Island, NY.* For use in any radial or multiple-spindle drillpress. Diameter range is from 1.250 to 5.812 in. Rigid carbide cutting edges are provided; hardened and ground stop collars govern depth of cut. Special cutters and custom single-fluted bore reamers are available for boring smaller diameter or milling special shapes, contours and angles.

FLOATING REAMERS — *Wickman Manufacturing Co, 10325 Capital Ave, Detroit, Mich.* Designed to assure accuracy of bore, absolute concentricity, and superfine surface. S type has standard blades; SL type has blades designed for reaming blind holes. Diameters from ¾ to 4 in. HSS or tungsten carbide tipped.

CHUCKING REAMERS—*Whitman & Barnes, Plymouth, Mich.* Straight-flute type range from 3/64 to 31/64 in. by 64ths. Spiral flutes from 5/64 to 31/64 by 64ths.



CARBIDE-TIPPED TOOLS — *Ariel Products Co, 4050 W 123rd St, Blue Island, Ill.* One-piece construction boring tools. Positioned from flat base which is easy to grind.

ADJUSTABLE DRILL—*Hayden Twist Drill Co, 8626 Lyndon Ave, Detroit 21, Mich.* Capacity is from 2 to 3 in. with one set of blades and from 3 to 4 in. with second set. Body of drill is heat-treated alloy steel; blades are HSS. Carbide-tipped drills are also available.

CARBIDE-TIPPED DRILL — *Hayden Twist Drill Co, 8626 Lyndon Ave, Detroit 21, Mich.* Fluteless tool for drilling plastics and shallow holes in cast iron is said to cost 1/10 price of conventional tipped HSS drill. Sizes from 13/64 to 11/16 in.

TWIST DRILLS—*The Kneisley Electric Co, Toledo, Ohio.* HSS drill sets contain drills varying from 1/36 to ¼ or ½ in. in steps of 1/64 or 1/32 in.

DRILL—*Tempered Steel Drill Co, 3610 Superior Ave, Cleveland 14, Ohio.* For hardened steel up to 68 R_c; three wide lands keep drill from floating.

ADJUSTABLE TAP—*Landis Machine Co, Waynesboro, Pa.* Taps and chamfers standard pipe and drainage fittings in one operation. Tapping is performed on forward cycle and chamfering during reversal. Sizes from 1¼ to 4 in.

FACE MILLING CUTTER—*Motch & Merryweather Machinery Co, Cutting Tool Mfg Div, Penton Bldg, Cleveland 13, Ohio.* Composed of body, blade, and wedge. Available as general type and heavy-duty. HSS and cemented carbide-tipped blades are available with dia of 3 through 18 in.

MILLING CUTTERS—*Millit, Inc, 55 Flint St, Rochester 8, NY.* Extended-width slotting cutters; stagger-tooth method of mounting replaceable blades allows manufacturer to make any width cutter desired. A-size blades are for cutters from ½ to ¾ in. wide; B-size for larger. Blades have cast alloy, HSS, or carbide tips.

SPECIAL CUTTER—*Sonnet Supply Co, 576 N Prairie Ave, Hawthorne, Calif.* Carbide-tipped tool has four flutes, each performing one operation, to produce AND 10050 port or connecting holes for hydraulic valves and fittings.

END MILLS — *Super Tool Co, 21650 Hoover Rd, Detroit, Mich.* Inserted-blade shell end mills for steel, cast-iron, and non-ferrous metals. Steel cutters in diameters of 4, 5, 6, and 8 in.; cast-iron from 3 to 8 in.

END MILLS—*Goddard & Goddard Co, 12280 Burt Rd, Detroit 23, Mich.* 149 stock end mills are now available with diameters from 1/16 to 2 in. Design features high helix and curved undercut on tooth faces.

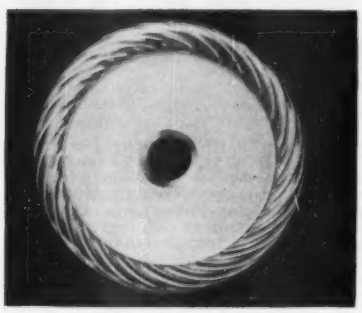
SHELL MILLS—*Wendt-Sonis Co, Hannibal, Mo.* Inserted-blade; sizes from 3- to 6-in. dia in 4- and 6-blade styles. Blades are available for steel and non-ferrous or for cast-iron milling. Carbide cutting edges are diamond-lapped.

GUN DRILLS—*Chicago-Latrobe, 411 W Ontario St, Chicago 10, Ill.* Carbide-tipped. Advantages are: drilling of deep holes, minimizing of runout, and increased production life.

MILLING CUTTERS—*Millit Inc, 55 Flint St, Rochester 8, NY.* Replaceable blades are seated on periphery of cutter body against an abutment that takes all cutting forces. Rake and shear angles are built into blade instead of body slot. Choice is provided of carbide, HSS, or cast-alloy tips.

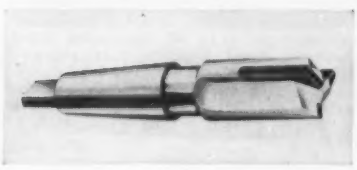
FLYCUTTER — *Paul D Rand Co, 11337 Homedale St, Los Angeles, 49, Calif.* Can be used with 3/16-, ¼-, or 5/16-in. toolbit. Price: $8.50. German.

ROTARY BROACH — *Shearcut Tool Co, 7045 Darby Ave, Reseda, Calif.* Finishes holes to accuracy of 0.0001 in.; surface finish from 10 to 40 rms. Sizes from 1/16 to 3 in. in 1/64-in. increments.



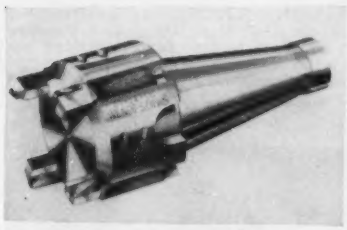
MILLING CUTTER—*Douglas Tool Co, 2300 E Nine Mile Rd, Hazel Park, Mich.* High-helix type designed to mill compound contoured surfaces. Cutting surface extends more than 90°.

FACE-MILLING CUTTER — *Super Tool Co, 21650 Hoover Rd, Detroit 13, Mich.* Solid carbide inserted-blade face milling cutter can also be used as half side mill. Threads are in the wedges. Sizes: 4, 6, 8, 10, 12, and 14 in. Super IBH.

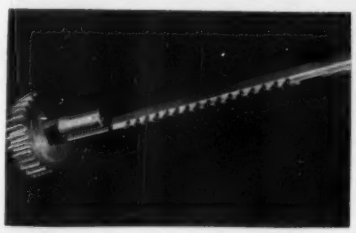


END MILL—*Super Tool Co, 21650 Hoover Rd, Detroit 13, Mich.* Three-fluted, center-cutting, carbide-tipped, designed for non-ferrous metals and available in both straight shank and B&S taper shank in six sizes, ⅜ to ¾ in.

SPECIAL BROACHES—*The du Mont Corp, Greenfield, Mass.* With cutting sections of 20 in. or less, overall length of 36 in. or less, and square broaches not smaller than ¼ in. across flats. Line includes pull-type, push-type and keyway broaches.



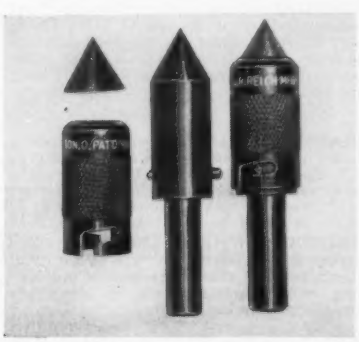
UNIVERSAL FLYCUTTERS—*Wendt-Sonis Co, Hannibal, Mo.* Blades are ground on both locating sides to assure minimum of runout. Sizes range from 3 to 6 in.; styles of four or six blades.



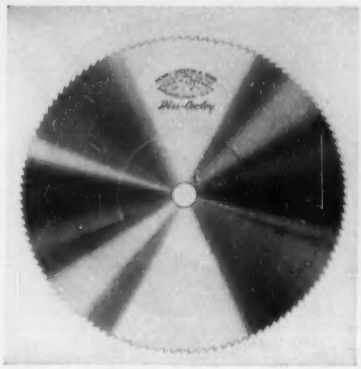
KEYWAY BROACH—*The du Mont Corp, Greenfield, Mass.* New tooth form requires less force, gives greater chip room, better curling of chips, and prevents clogging or wadding. Sizes from 1/16 to 1 in.

KEYWAY BROACH KIT—*The Du Mont Corp, Greenfield, Mass.* Combination kit provides broaches and bushings for standard-width keyways in 18 bore diameters.

THREAD BROACH—*Shearcut Tool Co, 7045 Darby Ave, Reseda, Calif.* Taps highly heat-treated steel parts of various alloys including chrome-moly alloys and stainless steel of 40 or 50 R_c. Sizes from NO. 4 to 12 machine screw and ¼ to 1½ in. (NC and NF).



CENTER LAPS—*The J R Reich Mfg Co, Dept B, 45 E Stroop Rd, Dayton 9, Ohio.* Sizes of ⅜ and ¾ in. with mandrels machined to 60°. Abrasive-cloth cone fits over mandrel.



CIRCULAR SAW — *Henry Disston & Sons, Inc, Philadelphia, Pa.* For cutting non-ferrous metals; diameters of 6, 8, 10, 12, and 14 in.

SLITTING SAW—*Nelco Tool Co, Manchester, Conn.* Alloy-steel bodies are built to width of teeth; overhanging carbide tips; full side chip clearance. Electroplating process prevents rust and color codes saws.

CARBIDE CONTOUR SAWS — *Gay-Lee Co, Clawson, Mich.* Variety of convex forms permit use of carbide to cut slots requiring form. Brazed carbide-tipped saws in diameters to 8 in., thicknesses of 0.030 in. and up; solid carbide saws from 0.020 in. up.

CIRCULAR SAWS—*Circular Tool Co, 765 Allens Ave, Providence, RI.* Designed to fill performance gap between carbide and HSS. Thicknesses from 1/16 to ¼ in.

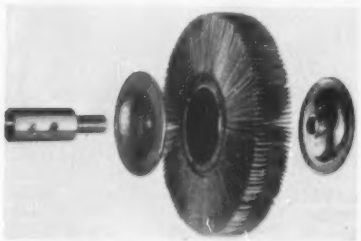
METAL-CUTTING SAWS—*L H Chappel & Co, 1137 Post Rd, Fairfield, Conn.* Line includes slitting, screw-slotting, small circular, side chip, and staggered-tooth saws. Made of high tungsten steel. British—Sheffield.

RADIAL-SAW BLADES—*Radial Cutter Manufacturing Corp, 835 Bond St, Elizabeth 4, NJ.* Carbide-tipped; heat-treated body. Available for crosscut, rip, combination, jointer, and trim use.

POWER BLADES — *Illinois Tool Works, 2501 Keeler Ave, Chicago 39, Ill.* Complete range to fit standard cut-off machines. Two types: HSS edge welded to chrome-vanadium-steel back and specially treated HSS blade.

GRINDING WHEEL — *Macklin Co, Jackson, Mich.* Loose abrasive is embedded in pellet form and constantly flows between metal and wheel. This is said to permit main body to be harder than normally used for grinding cemented carbide tools.

GRINDING WHEELS—*Super-Cut Distributors, Inc, 3418 N. Knox, Chicago 41, Ill.* Single-layer wheel for final microfinish work. Made with hard-nickel bond, can be indicated and trued to 0.0005 in. Price: $45.



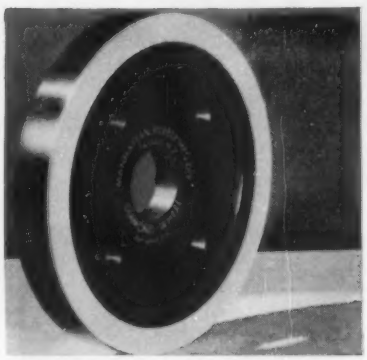
FLEXIBLE WHEEL—*Merit Product Inc, 4023 Irving City, Culver City, Calif.* Hundreds of individual abrasive cloth leaves sealed to hard core. Wheel is 6½ in. in dia, 1 in. wide. Grind-O-Flex.

ABRASIVE BELT SPLICER—*Aget-Detroit Co, 130 Main St, Ann Arbor, Mich.* Designed to increase speed and improve quality of splice. Electrical curing press reduces curing time to less than a minute. Accessibility is provided for lubrication and dressing.

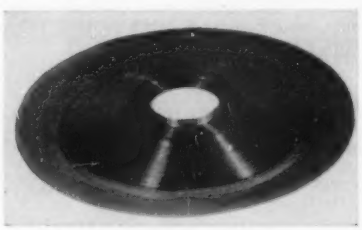
VITRIFIED G-BOND — *Norton Co, Worcester 6, Mass.* Reported to hold abrasive grains just long enough to keep grinding surface at peak efficiency. Said to be capable of faster cutting, longer wheel life, and better finish.

ABRASIVE PASTE—*Glyco Products Co, Inc, Brooklyn, N. Y.* Diamond powder compound in oily material in form of paste for polishing and lapping. Salvage of used diamond powder is simplified. Micron size of abrasive may be designated by color added to paste.

DIAMOND WHEEL—*Action Diamond Tool Co, 4545 West Grand Ave, Chicago 39, Ill.* Said to give fastest cutting action on carbide. Special alloy metal bond is reportedly non-glazing and non-loading.



DIAMOND WHEELS—*Raybestos-Manhattan, Inc, Manhattan Rubber Div, Passaic, NJ.* Metal-bonded; said to be more efficient. Lens grinding and glass edging are typical application.



DIAMOND WHEEL — *Ohio Metal Working Products Co, Cleveland, Ohio.* Electroplated nickel bond. Dia is 6 in.; width from ¾ to 1½ in. Reported to have longer life. Price: $83.00.

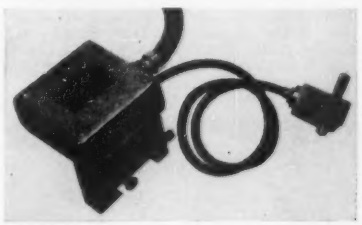
DIAMOND WHEELS—*Diamond Tool Research Co, 305 E 45th St, New York, NY.* New backing has high-aluminum powder content for added heat conductivity. Straight periphery wheels are 10-in. dia.

DIAMOND WHEELS—*Ace Abrasive Laboratories, 250 W 57th St, New York, NY.* Specially developed bonding method is said to give wheels max efficiency.

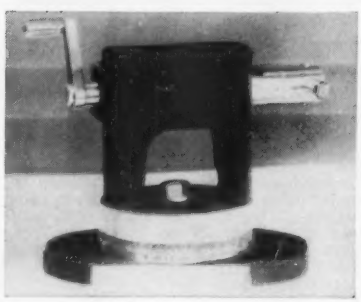
GRINDING WHEEL—*Electro Refractories & Abrasives Corp, Buffalo, NY.* Resin-bonded silicon carbide. Cool cutting characteristics said to eliminate danger of cracking tools.

WHEEL DRESSER—*Spike Manufacturing Co, 24609 Middlebelt Rd, Farmington, Mich.* Radius-tangent model is mounted on spindle to allow operator to dress wheel at desired radius without moving work from chuck.

WHEEL DRESSER—*L Newman Tool Die & Machine Work, Oakland Calif.* Can be bolted down for use on cylindrical grinders or used on magnetic chuck for surface grinding. Model No. 6.

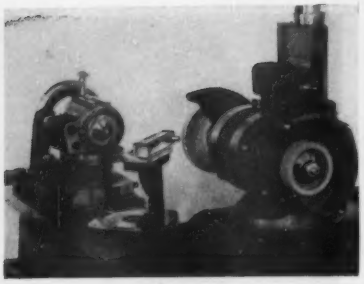


DIAMOND TURNER—*The Industrial Diamond Co, 2392 Wolcott, Ferndale 20, Mich.* Electro-mechanical device automatically indexes dressing diamond by positive, precise increments. Provides range of indexing in odd increments of rotation. Fits into existing diamond holder of machine.



ANGLE DRESSER—*Phelan Engineering Service, 1913 W Magnolia Blvd. Burbank, Calif.* Dresses both sides of emery wheels with double-end diamond; can be used on both cylindrical and surface grinders. Diamond travel is 2¼ in. and base is engraved with 1° graduations.

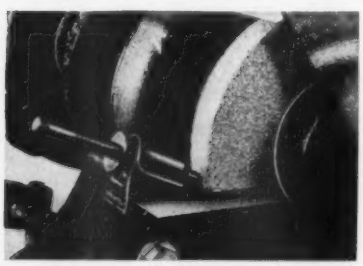
CONTOUR WHEEL DRESSER—*Hoglund Engineering and Manufacturing Co, Inc, 343 Snyder Ave, Berkeley Heights, NJ.* For wheel widths of 1, 2, or 3 in. Magnetic chuck for short runs; permanent mounting for long runs. Max wheel dia is 12 or 20 in. Model KB11-1, -2, or -3.



ANGLE DRESSER—*Royal Oak Tool & Machine Co, Royal Oak, Mich.* Graduated base; 5 min vernier; plate can be set to any angle; inverted T-slide permits dressing wheel on either side.

DIAMOND HOLDERS — *Diamonds and Tools, Inc, 19345 John R St, Detroit 3, Mich.* Oxide coating resists corrosive coolants. Diamonds are set in holders with alloy having low coefficient of expansion.

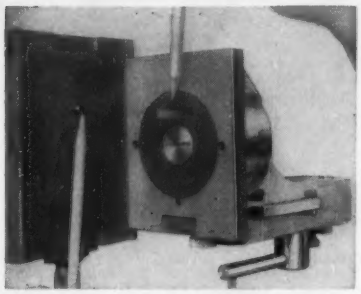
WHEEL-TRUING METHOD — *Super-Cut Distributors, Inc, 3418 N Knox Ave, Chicago 41, Ill.* Involves auxiliary tapped opening in wheels fitted with small screws for mounting and lining up cup-type diamond wheels used on machines with backplates. Available on 6-, 7-, and 10-in.-dia shallow or plain cup-type wheels.



DIAMOND DRESSER—*Hazerodt Associates, 416 Ford Bldg, Detroit 26, Mich.* Does angle or side dressing on pedestal, hand, carbide, surface, disk, and toolroom grinders. For wheel to 10-in. dia.

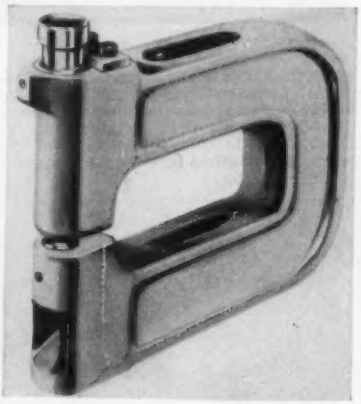
DIAMOND DRESSING TOOL—*US Diamond Wheel Co, 835 Illinois Ave, Ill.* Hand hone tipped with diamond concentrate. Hollowed-out finger rest provides fingertip control. Available in single- and double-end styles.

CONTOUR DRESSER—*Hogland Engineering & Manufacturing Co, Inc, 343-2 Snyder Ave, Berkeley Heights, NJ.* Mounts permanently to right of footstock on inclined-table plain cylindrical grinders. It is claimed that any contour that can be entered by a diamond can be dressed into the wheel with accuracy of a few "tenths." Width of contour is variable up to 2 in., depending on ratio templet desired. Templet ratios are variable from 1:1 to 20:1.



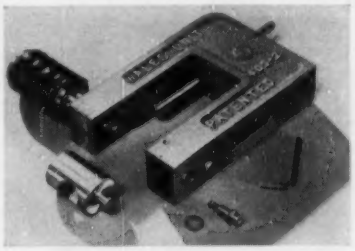
WHEEL DRESSER *J & S Tool Co, 644 W Mt. Pleasant Ave, Livingston, NJ.* Dresses two angles tangent to radius in one continuous motion without using dovetails. Also does cylindrical grinding to 0.0001-in. accuracy. Model REC.

DIAMOND-IMPREGNATED TOOL—*Wheel Trueing Tool Co, 3200 W Davison, Detroit, Mich.* Consists of diamond-surfaced block of matrix material molded in reverse of shape required in abrasive wheel. Unit reportedly cuts time because many diamonds are in contact with wheel.



HOLE-PUNCHING UNIT—*Toolset Div of General Riveters, Inc, Buffalo, NY.* Mounts on lower bed of press to eliminate customary die sets. Press furnishes necessary force. Stock sizes have throat depth from 4 to 16 in.

PUNCHING ASSEMBLY — *Wales-Strippit Corp, 345 Payne Ave, N Tonawanda, NY.* Multiple hole-punching assembly with punch retainer plates for unlimited patterns. Punching assemblies and dies are interchangeable. Sizes are available from 6x6 to 24x24 in.

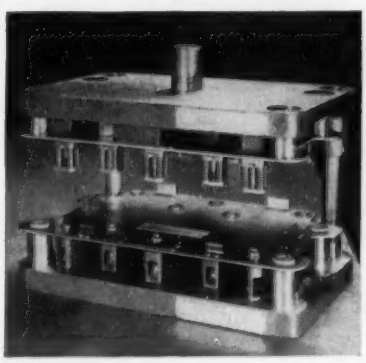


HOLE PUNCHING UNITS — *Wales-Strippit Corp, 345 Payne Ave, North Tonawanda, NY.* Provide positive die retainer and simplified die-removal method. Consists of holder, die, and stripping mechanism. Max punch diameter of ¾ in.; metal thickness of ½ in.; 3 holder widths. Model CJ.

DIE SET POSITIONER — *Diamond Machine Tool Co, 5511 Coffman-Pico Rd, Pico, Calif.* Hand-operated turret punch press incorporates punch indexing control for automatic exact positioning of die sets. Punches and dies are geared together. Turret has 13-in. stroke and contains 12 punches and dies interchangeable between turret positions. Capacity is 10 tons and max punch size is 1½ in. with ⅛-in. mild steel.

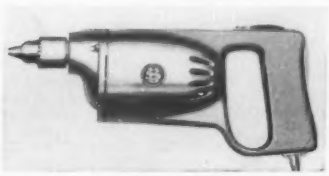
PUNCHING UNIT—*Wales Strippit Corp, 345 Payne Ave, North Tonawanda, NY.* Horizontal units punch holes in curved and straight flanges, rims, and angles. Units eliminate single-purpose cam-action dies. Capacity is up to ½ in. in mild steel ⅛ in. thick.

PUNCH AND DIE—*Fenway Machine Sales Co, 263 N 23rd St, Philadelphia 3, Pa.* Built into hand nibbler. Cuts up to 14-gage steel. Each stroke of punch removes a slug of metal; part can be fed in length of removed metal. Can be used as hand instrument or clamped in vise.

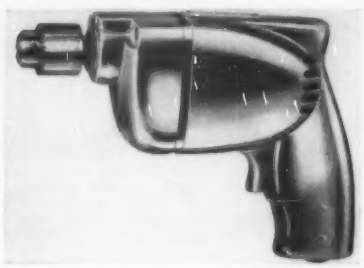


MAGNETIC PERFORATING DIES—*S B Whistler & Sons, 744 Military Rd, Buffalo 23, NY.* Perforate material up to ¼-in. mild steel. To make up die, two blank templets are bored to admit assembly of punch and die units. Parts and templets can be reused in other arrangements. Can be used in press having minimum shut-height of 9½ in. Tolerances can be held to 0.0005 in.

DRILL—*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* Equipped with ac-dc motor, geared chuck, and trigger switch. Spindle speed is 500 rpm. Model 127.



ELECTRIC DRILL — *US Electrical Tool Div, Emerson Electric Mfg Co, St Louis 21, Mo.* ¼-in. drill has full ball-bearing construction and aluminum alloy frame. No-load speed is 2500 rpm. Price $28.00.



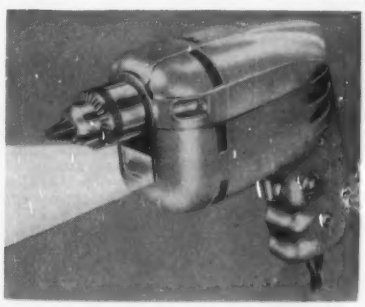
ELECTRIC DRILL — *Cummins-Chicago Corp, 4740 N Ravenswood Ave, Chicago, Ill.* Low-cost line; hardened gears; full-grip handle; geared chuck.

PNEUMATIC DRILL—*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* Designed for heavy duty. Contour pistol grip; trigger throttle; speed regulator; ¼-in. Jacobs chuck. Model PD-304P.

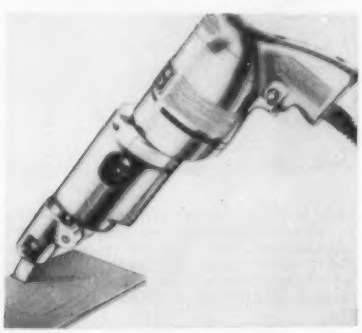
SAFETY SWITCH—*Tricop Distributing Co, 308 W Center St, Akron 2, Ohio.* For portable drills; requires insertion of key in switch to complete circuit.

LIGHTWEIGHT DRILL — *Stanley Electric Tools, New Britain, Conn.* ¼-in. drill in speeds ranging from 600 to 5000 rpm. Built for production work; designed for easy handling in close quarters.

ELECTRIC DRILL — *Independent Pneumatic Tool Co, Aurora, Ill.* ¼-in. copper line electric drill with pistol-grip operation. Momentary switch has lockpin; available with geared or keyless chuck.



ELECTRIC DRILL—*Fairchild Industries, Div of Fairchild Camera & Instrument Corp, Burlington, Vt.* Standard-duty, ¼-in. drill weighs 3 lb. No-load speed is 2100, full-load speed 1000 rpm. Has built-in light beneath spindle. Price: $27.95.



DRILL ATTACHMENT—*Jaco Devices, Inc, 90 High St, Hingham, Mass.* Converts drill into power saw; adaptable to most standard drills running at 1700 to 3000 rpm with power rating of 1.7 amp or more.

DRILL ATTACHMENT — *E-Z Way Tool Co, Barrington, Ill.* Cam-action attachment to convert rotary drill into thrust-action saw. Each rev is turned into ⅞-in. stroke.

POWER TOOL — *Selectric, Dept Yu, Lynwood, Calif.* For drilling and finishing all types of metals; speed is 25,000 rpm. Kit includes 40 accessories. Price: $29.95.

DRILL EXTENSION ROD—*Beaver Tool Co Box 298, Huntington, Long Island, NY.* Kit includes 52 small-dia extension chucks fitting one extension rod 8½ in. long with ¼-in. dia. Price: $5.95.

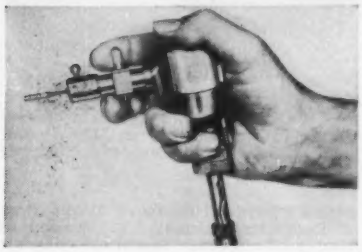
POWER BIT—*Zephyr Mfg Co, Inglewood, Calif.* For production screwdriving. Two grades—one for aircraft and one for automotive industry. Four basic shank sizes in both hexagon and square inserts.

STUD PULLER—*Faver, Inc, 770 South Second West, Salt Lake City, Utah.* For use on drillpress, milling machine, and lathe. Said to eliminate 93% of stud bolt breakage because of dead-center pull. Several sizes range in price from $14.95 to $39.95.

AIR-OPERATED SCREWDRIVERS —*Thor Power Tool Co, Aurora, Ill.* Reversible motors also permit use for removing threaded fasteners. Four models have basic speeds ranging from 475 to 2000 rpm. Each has slip clutch or positive clutch.

PRODUCTION SCREWDRIVER — *Mall Tool Co, 7725 South Chicago Ave, Chicago 19, Ill.* Electric production screwdriver and tool balancer operates at 1200 rpm. Butt end of tool has bail for overhead suspension from tool balancer holding 15-ft steel cable in steel housing. Balancer takes other portable tools weighing up to 10 lb.

IMPACT POWER DRIVE — *Drilo Corp, 201 East Carson St, Pittsburgh, Pa.* Converts all electric drills into impact screwdrivers. Cone construction permits control of force and speed of driver. Price: $9.95.



RECIPROCATING TOOL — *Engis Equipment Co, 431 South Dearborn St, Chicago, Ill.* Driven by flexible shaft with standard connections; has controlled stroke varying from 0 to 6 mm; reciprocation speed can be varied from 0 to 100 sps. Said to provide greater speed and accuracy on filing, lapping, scraping, honing, and polishing operations. Di-Profiler.

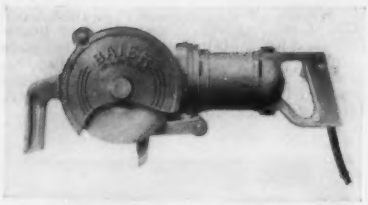
IMPACT TOOL — *Syntron Company, Homer City, Pa.* The instant torque builds to certain point, rotary motion is changed into 2000 blows per min.

IMPACT WRENCH—*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* Handles up to ⅞-in. nuts and bolts. Pistol grip with detachable side handles. Spindle speed 1800 rpm; weight 16¾ lb. Model 4EW.

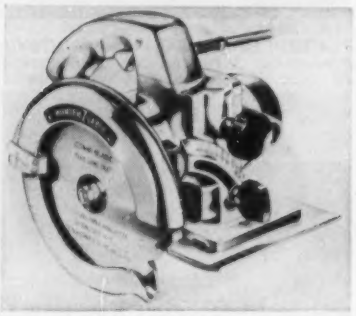
PNEUMATIC IMPACT WRENCHES —*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* Three new sizes. 5014S takes ⅞-in. bolt, has ¾-in. square-drive spindle, speed is 1600 rpm free at 90 psi. 4012P has same size spindle, takes ¾-in. bolt, has speed of 1300 rpm. 308P has bolt- and spindle-capacity of ½ in., speed of 1400 rpm.

ELECTRIC HANDTOOL — *Precise Product Co, 1328 Clark St, Racine, Wis.* Will operate tungsten carbide midget mills as well as other rotary tools for grinding, milling, finishing, and polishing within range from 3/32 to 3/16 in. Spindle turns at 45,000 rpm and with speed control can be reduced to 15,000 in stages. Unit is air-cooled and said to be vibrationless.

IMPACT WRENCHES—*Master Pneumatic Tool Co, Inc, Krick Rd, Bedford, Ohio.* Operate on air pressures of 80 to 100 psi. Model M960 has bolt capacity of ⅝ in.; M970 bolt capacity of ¾ in.



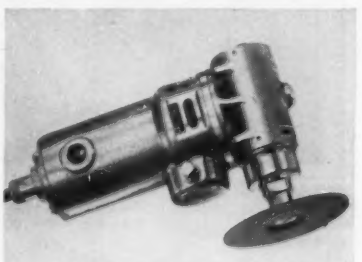
HANDSAW — *Alina Corp, 401 Broadway, New York 13, NY.* High-alloy steel blade cuts 2- or 3-in. bar stock. Powered electrically or by air pressure.



ELECTRIC SAW — *Porter-Cable Machine Co, 24 Exchange St, Syracuse, NY.* Three types of abrasive blades enable cutting of stone, metal, and tough compositions. Telescoping guard moves into cut without drag. Bevel and depth adjustments are provided. Price: $75.

SAW TABLE—*Porter-Cable Machine Co, 20 Exchange St, Syracuse, NY.* Converts portable electric saw into table saw with angle gage riding in slot parallel to fence. Table is 18x21 in. and zinc-plated.

AERIAL GRINDER — *Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* Wheel is 6x1 in.; spindle speed, 3730 rpm free. Other models use 5x1 and 4x1 wheel.



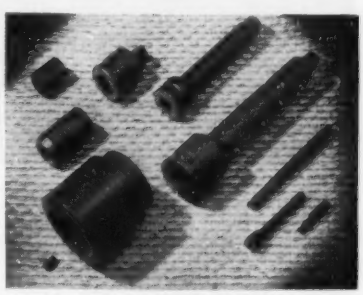
HIGH-SPEED GRINDER — *Franklin Balmer Corp, Baltimore, Md.* Portable electric tool has no-load speed of 9000 rpm. Incorporates double-cooling fan and collet chuck. Diskette model B-2.

DISK SANDER—*Tomlee Tool and Engineering Co, Inc, Minneapolis 1, Minn.* Grinds, burrs, and chamfers. 10-in. disk forms compound angles up 45°. Model 85.

PENCIL GRINDER—*Nu-Jett Products, 1335 Michigan N E, Grand Rapids, Mich.* Designed with opposed spirals running length of barrel and rotor. Weighs 4 oz. develops speeds to 110,000 rpm. Said to be particularly adapted for use with carbide burs.

PORTABLE GRINDERS — *Buckeye Tools Corp, Div 15, Box 966, Dayton 1, Ohio.* Air-operated; take 2-in. organic wheel. Feature one-piece shaft design. Available with lock button or lever throttle.

FLEXIBLE-SHAFT GRINDER — *The Franklin Balmar Corp, N A Strand Div, Baltimore, Md.* Gasoline-engine powered; shaft has 7-ft length; ¾-in.-capacity hand spindle takes conventional tools and wheels up to 10x1½ in. Engine base swings through 180°. Model DGX-7.

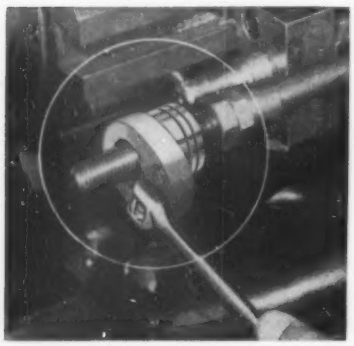


POWER-IMPACT TOOLS—*The Cornwell Quality Tools Co, 1004 Cleveland Ave, Mogadore, Ohio.* Sockets, extensions, adapters, and drivers for standard air or electrically powered tools. Machined to SAE tolerances.

NUT SOCKET—*Cornwell Quality Tools Co, 1004 Cleveland Ave, Mogadore, Ohio.* Hexagonal to permit nut-running tool positively engage nut while turning; designed for use on air- or electric-power-drive tools. Available in size ranges with increments of 1/16 in.

AIR TACKER—*Heller Co, 2153 Superior Ave, Cleveland, Ohio.* Bumper trip drives more than 200 staples per min. Loads double bar of staples from 5/32 to 13/-16 in. long.

RATCHET WRENCH—*Tubing Appliance Co, Los Angeles, Calif.* Open end permits introduction from any side of socket. Requires 7° clearance for square-drive handle. 64 sizes cover range from ⅜ to 4-in. in 1/16-in. increments.



RATCHET WRENCH—*Tubing Appliance Co, 10321 Anza Ave, Los Angeles 45, Calif.* Socket wrench has ability to ratchet in 7° arc. Four sets with snap-in sockets accommodate hex-nut sizes from 0.375 to 2.125 in.

PIPE WRENCH—*Ampco Metal Inc, 1745 S 38th St, Milwaukee 46, Wis.* Aluminum alloy with beryllium copper jaw inserts. Weight ranges from 15 oz for 10-in. size to 128 oz for 36-in. size.

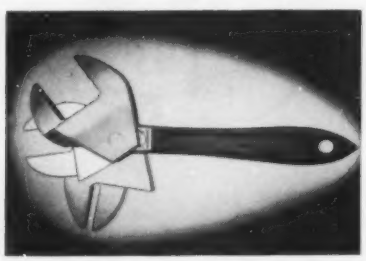
STUD WRENCHES—*Clark Feather Mfg Co, Fort Morgan, Colo.* Handle OD from ¼ to ¾ in.; ratchet action is built-in; milled jaw teeth of special steel are said to bite with progressive power for either right- or left-hand turns. Series SW.

ADJUSTABLE WRENCH—*Utica Drop Forge & Tool Corp, Utica 4, NY.* Includes provision for locking jaws at any setting; also acts as vise wrench which exerts 100-lb. grip. Lever snaps over handle and operates on knurl to control locking action. When used as vise wrench, locking lever is moved out until "clutch" mechanism engages the knurl. Sizes are 8, 10, and 12 in.

WRENCH—*Blackhawk Mfg Co, Milwaukee 46, Wis.* Wedge head fits into places where ordinary open ends cannot reach. Hollow dome inside head gives full jaw grip at all angles. Sizes are 7/16 to ½, 9/16 to ⅝, and ¾ to ⅞ in.

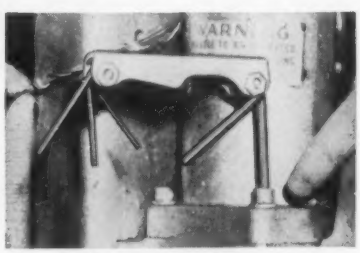
SOCKET WRENCHES—*Plomb Tool Co, Los Angeles, Calif.* Hollow-head-screw and metric-size socket wrenches added to Proto line. Metric line includes nine ¼-in. drive sockets with capacity from 4 to 12 mm, 20 ½-in. from 12 to 32 mm.

FLEXIBLE WRENCH—*Aetna Mfg Co, Flexsocket Wrench Div, Bensenville, Ill.* For hexagon socket-head screws; not intended to loosen wrench from seat. Set includes five wrenches.



AUTOMATIC WRENCH—*Fuller & Hellmann, Inc, Moro Oregon.* Open-end; self adjusting; handles any nut from ¼ to 1¼ in. with ratchet-like action. Head rotates 130° on end of handle. German—Plattina.

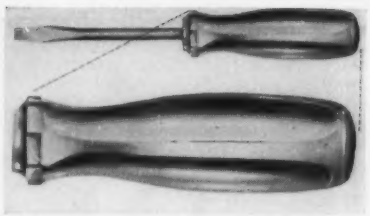
TORQUE-LIMITING WRENCHES—*Plomb Tool Co, Washington & Santa Fe Aves, Los Angeles, Calif.* Capacities of 100 to 750 and 750 to 1600 in.-lb. Three models have plain head and three have reversible ratchet head. Drive sizes are ⅜ and ½ in.



ALLEN WRENCH SETS—*H D Hunter Tool Co, Whittier, Calif.* Contained in knife-like folding handle carrying five sizes.

TORQUE - LIMITING WRENCH—*Plomb Tool Co, Los Angeles, Calif.* Releases automatically at proper torque set by turning handle like micrometer. Capacities are 5 to 75 or 10 to 150 ft lb with drive sizes of ⅜ or ½ in.

DIAGONAL PLIERS—*Utica Drop Forge & Tool Corp, Utica, NY.* Equipped with Plastisol cushion throat. Insert acts as third hand to hold short end of electrical or spring wire during cutting.



SCREWDRIVERS—*Plomb Tool Co, Los Angeles, Calif.* Handles of larger diameter shaped to fit the hand; lengthwise flutes prevent rolling. 13 models.

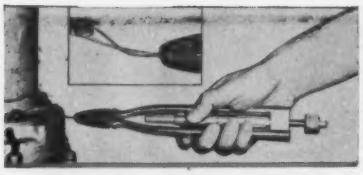
SCREWDRIVERS—*Utica Drop Forge & Tool Corp, Utica, NY.* Variety of blades of chrome, vanadium, electric furnace steel. Blade lengths from 1¼ to 12 in.

SCREWDRIVERS—*Billings & Spencer Co, Laurel St, Hartford, Conn.* Plastic and wood handles. Blade lengths run from 1½ to 12 in.

COLD CHISELS—*The Billings & Spencer Co, Laurel St, Hartford, Conn.* Standard-size, octagon-shank chisels have cutting edges ranging from ¼ to 1 in. Extra-long units are available with lengths of 12, 15, and 18 in.

RATCHETING TOOL—*Tubing Appliance Co, 10321 Anza Ave, Los Angeles 45, Calif.* Adapters for open-end ratchet wrench allow internal wrenching of Allen- and Phillips-head bolts and screws.

SCREWJACK—*Vard, Inc, Pasadena, Calif.* Standard sizes have dia from ⅜ to 4 in. and lengths to 22 ft. Made with helical nut and screw, each having helical ball races, precision ground. Ball circuit is closed with return tube attached to nut.



WIRE TWISTER—*Ralph C. Robinson Co, Box 494, North Sacramento, Calif.* Designed for safety wiring of aircraft engines, carburetors, magnetos, and radio equipment. Operates as pliers, wire cutters, and twister. Production model is $19.50; bench model $18.50.

CRIMPING TOOL — *Aircraft-Marine Products, Inc, Harrisburg, Pa.* For crimping stranded or solid wire, from No. 8 to 4/0, to solderless terminals. Develops 12-ton pressure, rotates 360°.

GRADED FILES — *Tacony File & Hardware Co, 2815 N 4th St, Philadelphia, Pa.* Set of 18 graded files is micrometer-checked in production. Each equaling file is 4 in. long and ½ in. wide and thickness ranges from 0.0072 to 0.0090 in. with tolerances ranging from 0.0007 to 0.0004 in. Price $12.

FILES—*Illinois Tool Works, 2501 N Keeler Ave, Chicago 39, Ill.* Plastic kit contains 12 basic shapes for power-filing use. ⅜-in. shanks and 4-in. length of cut. Price: $12.00.

CARBIDE TOOL HONE — *Chicago Wheel & Mfg Co, 1101 W Monroe St, Chicago, Ill.* Claimed to give 30% longer tool life between grinds by on-machine sharpening of single-point carbide tools. Silicon carbide with vitrified bond.

ABRASIVE ROLL—*Minnesota Mining and Manufacturing Co, 900 Fauquier St, St Paul 6, Minn.* File cutting surface feeds from abrasive roll. File holds 6 ft of cloth, features 11-in. stroke. Grits range from 24 to 320.

V-BELT TOOL—*Brammer Corp, 684 Broadway, New York, NY.* Designed to simplify attaching or detaching of V-link belting.

TRANSFER SCREWS — *Heimann Manufacturing Co, Urbana, Ohio.* Threaded center punch used in leader pin die sets for locating open and blind threaded holes. Set now includes No. 6 and 8 NC.

EXTRACTING TOOL—*Roddick Tool Co, Anaheim, Calif.* Range of 20 sizes; forms teeth inside hole until shoulder contacts part and permits high torque without expansion.

SCREW EXTRACTORS — *J H Williams & Co, Buffalo 7, NY.* Remove broken screws, bolts, and studs without injuring threads. Nine sizes.

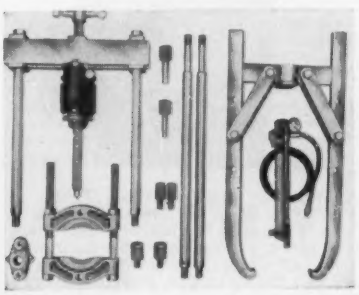
AUTOMATIC TWEEZER—*Win Sales Co, Dept 16-F, PO Box 257, Forest Hills, NY.* For odd-shaped items, hot pieces, and sterile objects. Spring-steel fingers extend to 1¼ in. between tips.

INSERTING TOOL—*Heli-Coil Corp, 1285 Shelter Rocklane, Danbury, Conn.* Made of nylon; developed for installation of Heli-Coil stainless steel wire thread inserts. Available in wide range of thread series.

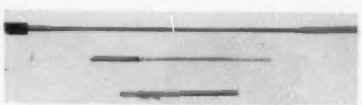
SUCTION TOOL—*Larrimore Sales Co, Mfg Div, PO Box 1234, St. Louis, Mo.* For lifting lenses and similar objects and placing them in deep cavities. Lensetter model 230.

BUSHING DRIVER—*Titan Tool Co, Main St, Fairview, Pa.* Provides automatic positioning of threaded inserts to proper depth below face of casting. Equipped with ½-in. female square drive.

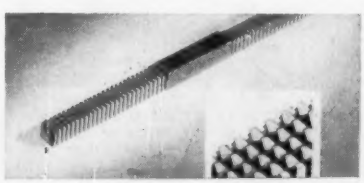
BUSHING EXTRACTOR — *Crozier Machine Tool Co, 684 North Prairie Ave, Hawthorne, Calif.* For extraction from any hole with ID from ¼ to 25/32 in. Set consists of ten threaded expanding arbors and draw-table. Series 100.



PULLER SET—*Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* 50-ton hydraulic unit with suitable pullers and attachments for removing and installing gears, bearings, wheels, and shafts. No. Y-285.



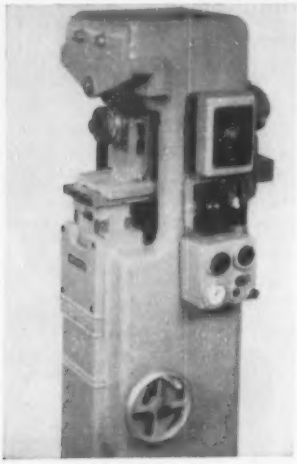
MAGNET TOOLS — *Snap-On Tools Corp, Kenosha, Wis.* Remove metal chips and other objects from inaccessible spots. Variety of sizes and styles including adjustable or flexible shafts.



THREAD RESTORING TOOL—*Reiff & Nestor Co, Lykens, Pa.* Eliminates shaping with three-cornered tool or use of die. Tool is used like file, is made of hardened steel 2½ in. long and 7/16 in. square.

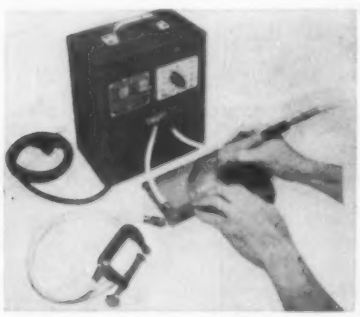
BAR KNOBS—*West Point Manufacturing Co, 26935 W 7 Mile Road, Detroit, Mich.* Replace standard knobs and handwheels where stronger clamping action is necessary. Bars inserted between four prongs permit greater leverage.

CHIP RETRIEVER—*General Scientific Equipment Co, 2700 W Huntingdon St, Philadelphia 32, Pa.* Magnetic tool removes chips from bliind holes, can also be used to test coat of surfaces for magnetic properties of base. ¼-in.-dia unit is $3.75; ⅜-in., $6.50.



MARKING MACHINE — *Noble & Westbrook Mfg Co, East Hartford 8, Conn.* Primarily for machine-tool dials, roll-marks, graduations and figures in steel, aluminum, or cast iron with straight dia up to 6 in. Pneumatic table compensates for slight variations in work diameter. Roll-O-Mark model 336.

MARKING MACHINE—*H C Sweet Co, 24396 West 7 Mile Road, Detroit, Mich.* Equipped with third retractable wheel acting as line guide 18 in. ahead of carriage. Price: $97.50.

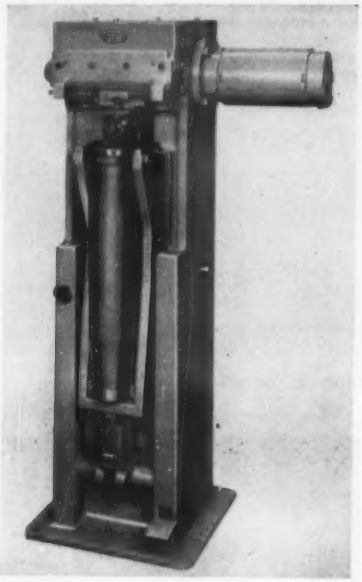


ELECTRIC MARKER—*H P Preis Engraving Machine Co, Hillside, NJ.* For free-hand marking on all alloy steel and ferrous alloys as well as wrought and cast iron. Stroke intensity is varied by dial adjustment. Both standard and heavy-duty sizes.

ELECTRIC ETCHER — *Martindale Electric Co, 1375 Hird Ave, Cleveland 7, Ohio.* Ratings of taps on secondary are 180, 310, 425, 550, 800, and 1375 w. Model A-A.

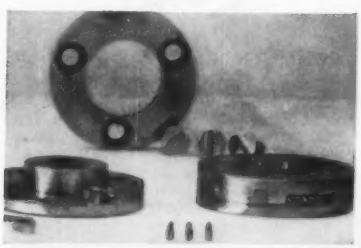
MARKING DEVICE — *New Method Steel Stamps, Inc, 147 Jos Campau, Detroit, Mich.* Permits die marking on end face of parts during machine cycle. Marks face diameters of 1½ in. and up.

NUMBERING DIAL — *New Hermes Engraving Machine Corp, New York, NY.* Attachment for use on Hermes Engravograph. Eliminates necessity of sliding new numeral templets into machine after each number has been engraved.



CARTRIDGE CASE MARKING—*The Noble & Westbrook Mfg Co, East Hartford 8, Conn.* For brass or steel cartridge cases up to 105 mm shell size. Air-powered work slide and die slide are controlled by push-button or pedal. Sequencing is automatic. Model 353.

FUSE CARTRIDGE MARKING — *Markem Machine Co, Keene, NH.* Machine prints label information directly on cartridge enclosed fuses. Ink unaffected by moisture or chemical atmospheres. Model 51A.

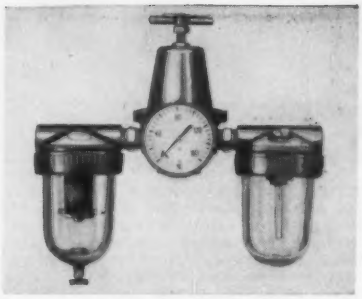


STEEL ROLLER STAMP — *Acme Marking Equipment Co, 8030 Lyndon, Detroit 21, Mich.* For use in regular marking machines, screw machines, or lathes. Ramlock, special locking feature, is said to prevent type slippage. Type inserts are of tough alloy steel, heat-treated and beveled.

STEEL LETTER SETS — *Parker Stamp Works, 650 Franklin Ave, Hartford, Conn.* Size range from 1/32 to 1 in. with plain gothic characters. Packaged in plastic boxes.

DATE STAMPS—*The Parker Stamp Works, Inc, 650 Franklin Ave, Hartford, Conn.* For indelible marking of tools and assemblies with date of manufacture. Character sizes of 1/16, ⅛, and 3/16 in.

PERMANENT INK—*John P Nissen, Jr, Co, Glenside, Pa.* Marks rough castings, bar stock, jigs, etc. Unaffected by heat and weather. Six colors.



FILTER - LUBRICATOR — *Arrow Tools, Inc, 1900 S Kostner Ave, Chicago, Ill.* Filter has porous bronze element said to retain more sediment with less pressure drop. Lubricator delivers finely vaporized mist of oil into airstream to provide positive lubrication to working parts of air-operated equipment.

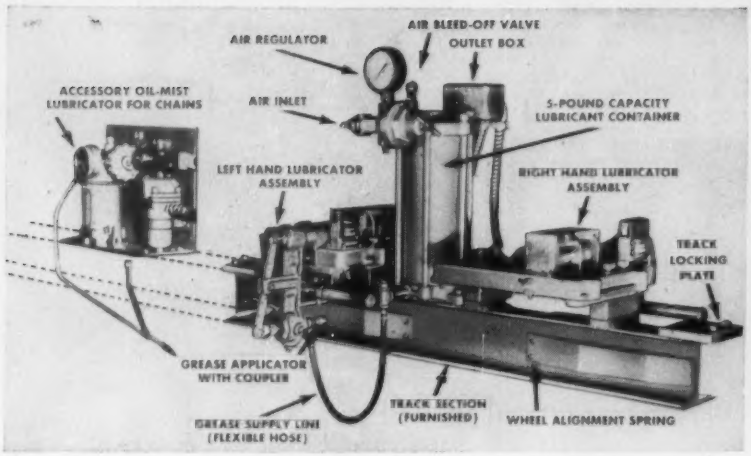
LUBRICATOR — *Bijur Lubricating Corp, Rochelle Park, NJ.* For wide variety of machines; actuated by switches tripped by rotary or reciprocating motion, electric timer controls, or push-buttons. Delivers 6 to 24 drops per stroke at 4 spm. Type E.

AUTOMATIC OILING—*J N Fauver Co, Inc, 51 W Hancock, Detroit 1, Mich.* For bearings, slides, and transmissions. Has no moving parts—oil is atomized and carried by compressed air. Oil-Air.

CENTRALIZED LUBRICATION — *Lincoln Engineering Co, 5701 National Bridge Ave, St Louis 20, Mo.* Services 5 to 12 bearings on standard inclinable or straight-sided punch presses. Manually operated system applies controlled amounts of oil or light grease. Price: $29.95.

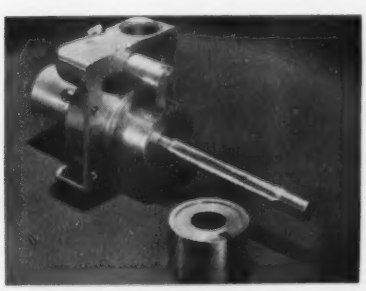
GREASE-FITTING COVER—*Winner Mfg Co, Box 945, Fort Wayne 1, Ind.* Oil-resistant Neoprene; for Zerk- or Alemite-type fittings.

LUBRICATOR—*C A Norgren Co, Englewood, Col.* Produces extremely fine-oil fog for bearings, spindles, gearboxes, and small air-powered devices. Can be adjusted to deliver as little as one drop every twenty minutes. Designed for ¼-in. airlines.



HAND OILERS—*K-P Manufacturing Co, 1218 Linden Ave, Minneapolis, Minn.* Have 6-oz capacity and 6-in. rigid steel spout interchangeable with 12-in. flexible spout. Model 500.

OIL CIRCULATING SYSTEM — *Trabon Engineering Corp, 1814 E 40th St, Cleveland, Ohio.* Positive-displacement system controls flow of oil to bearings under pressure. Flow rates up to 80 cu in. per minute. Meterfio series RTP-2000.



IMPELLER PUMP—*Eco Engineering, Newark, NJ.* Bronze-impeller, positive-displacement pump handles oils and greases at temperatures up to 500 F. Max capacity is 10 gpm. Self-priming at low temperatures.

AUTOMATIC LUBRICATION—*Stewart-Warner Corp, 1826 Diversey Pkwy, Chicago 14, Ill.* For conveyor trolley wheels; delivers preset shot of oil to passing wheels on each side. Contained on section of I-beam fitted into conveyor track.

LUBRICATOR—*Nathan Manufacturing Corp, 416 E. 106th St, New York 29, NY.* Delivers minute quantities of lubricant to as many as 36 points. Flow rate per feed ranges from 2.3 cu in. per hour to less than 1 cu in. in 700 hr. Lubricant can vary from light oil to light grease at 60 F.

GREASE GUNS—*Lincoln Engineering Co, Natural Bridge Ave, St Louis, Mo.* Said to hold 40 to 100% more lubricant than ordinary guns. 21- and 32-oz capacity with 4300- and 10,000-lb pressure.

MULTI-PURPOSE GREASE — *Shell Oil Co, 50 W 50th St, New York 20, NY.* Contains lithium 12-hydroxy stearate. Advantages claimed: high breakdown resistance, high water tolerance, broad temperature range, low rate of oxidation, long induction period, and good storage stability.

GREASE COMPOUND—*The Alpha, Corp, 179 Hamilton Ave, Greenwich, Conn.* For use as lubricant on synthetic rubber, plastics, leather, nylon, and fiber, as well as metals. Operating range from —50 to 400 F. Molykote-Silicone type 77.

GEARPUMP — *Sier-Bath Gear and Pump Co, Inc, 9252 Hudson Blvd, North Bergen, NJ.* For positive displacement of lubricating fluids from 32 to 250,000 SSU. Delivers 1 to 500 gpm; 300 psi for continuous duty, 500 psi for intermittent.

METALLIC LUBRICANT — *Imperial Oil & Grease Co, Inc, 6399 Wilshire Blvd, Los Angeles 48, Calif.* Employs petroleum as vehicle; available as grease or oil for all applications from heavy exposed gears to high-speed spindles. Series Molub-Alloy.

BEARING LUBRICANT—*The Alpha Corp, 179 Hamilton Ave, Greenwich, Conn.* For use as extreme-bearing-pressure additive to conventional oils used in four-speed lubrication systems and as additive to cutting and coolant oils where frictional component is substantial part of total cutting force. Molykote M-55.

LUBRICANT—*Destiny Products Co, 8427 Mack Ave, Detroit, Mich.* For blind-hole tapping; eliminates operations preliminary to bottoming by automatic hydraulic removal of chips from hole during thread cutting operation. Sticks of lubricant range from 9/64 to 1 in. with lengths from 3½ to 7½ in. Hypertap.

LUBRICANT — *Molyflo Corp, Greenwich, Conn.* For use on lithographing oven chains. Wax free; flash point over 500 F; carbon residue less than 0.01%. Type C-40.

HIGH-TEMPERATURE LUBE—*The Alpha Corp, 179 Hamilton Ave, Greenwich, Conn.* Dispersion lubricant for high temperature applications; dissipates under heat and leaves smooth film. Molykote M-30.

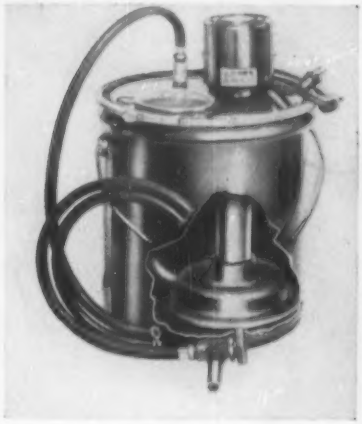
LUBRICANTS—*Van Straaten Chemical Co, 546 W Washington Blvd, Chicago, Ill.* For high-speed machining of stainless steel, molybdenum, and other high-alloy steels. Said to greatly increase tool life.

TOOL LUBRICANT — *Van Straaten Chemical Co, 546 W Washington St, Chicago 6, Ill.* For heavy tapping operations. Said to have extreme pressure characteristics and polarity which resists wiping action. Vantrol 5510B.

DRY FILM LUBRICANTS—*Everlube Co, 4435 B San Fernando Rd, Glendale, Calif.* Unaffected by solvents; can be sprayed, dipped, or brushed. Sample can is priced at $2.00.

CUTTING LUBRICANT — *Van Straaten Chemical Co, 546 W Washington Blvd, Chicago, Ill.* Water-emulsifiable for high-speed machining; said to give superior wetting and high penetration. Vantrol 5491A.

CUTTING LUBRICANT—*Anchor Chemical Co, 10721 Briggs Rd, Cleveland 11, Ohio.* Provides positive adhesive film between tool and work to dissipate heat generated by friction. Contains non-evaporating stabilizing agents and high rust-proofing properties. Anchorlube.



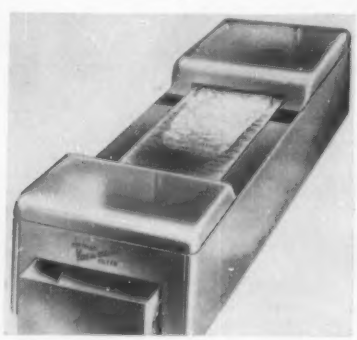
COOLANT PUMP—*Samuel S. Gerber Co, 162 N Clinton St, Chicago 6, Ill.* One moving assembly with no gears. Capacity is 400 gph at zero head, 200 at 6-ft head. Bantam.

COOLANT PUMP—*Mechanical Engineering Co, 608 S Dearborn St, Chicago 5, Ill.* Self-priming, centrifugal; designed for coolants and cutting oils. Discharge port may be restricted without loss of hp; adaptable to multiple-nozzle hookup. Price: $86.65.

COOLANT PUMP—*Wade & Sons, 918 E Truman Rd, Independence, Mo.* For installation in hollow column of conventional bench drillpress; driven by drillpress motor. Pump intake is screened. Price: $18.50.

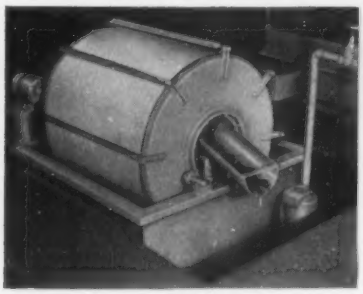
COOLANT PUMP—*Viking Industries, Rockford, Ill.* Motor-driven for operation with all oil and water-soluble coolants up to 20SAE. Capacity is 100 gph at 1-ft head. Inlet pipe has ½-in. opening. Price: $36.00.

PUMPS—*Taco Heaters, Inc, 137 South St, Providence, RI.* For pumping water at any temperature up to 210 F. Delivers 22 gpm at 21-ft head.



ENDLESS-BELT FILTER—*Industrial Filtration Div, US Hoffman Machinery Corp, 219 Lamson St, Syracuse 6, NY.* Incorporates vacuum pump to produce pressure differential in chamber over which belt moves; coolant is recirculated by built-in pump. Two models have 20 and 40 gph flow rate. Vacumatic.

COMBINATION FILTERS—*Barnes Drill Co, Rockford, Ill.* Coolant from machines flows around magnetic drum and then through filtering fabric of specific porosity. Capacities are 15, 30, and 60 gpm.



AUTOMATIC FILTER—*Murray-Way Corp, Birmingham, Mich.* Fresh area is rotated into position while contaminant cake is being ejected. Wire filtering screen is supplied in monel, stainless, brass, or bronze.

EMULSION DEODORANT—*Hersen Chemical Co, 825 Fisher Bldg, Detroit, Mich.* For treatment of rancid and odorous coolant and cutting oil emulsions. Single application reportedly restores unfit solutions to original condition. Rance-Rid.

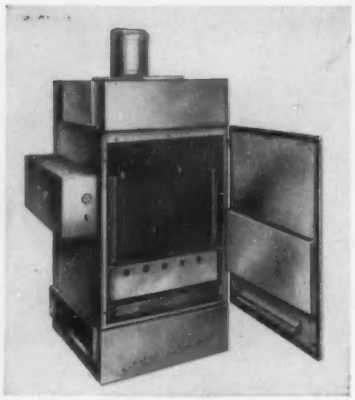
DRAWING LUBRICANTS—*Van Straaten Chemical Co, 546 W Washington St, Chicago 6, Ill.* For drawing or forming stainless and high-alloy steels as well as carbon steels. Available as pigmented or non-pigmented extreme-pressure paste compound. Series 5481.

SOLUBLE OIL—*Shear-Speed Chemical Products Division, 7125 E McNichols Rd, Detroit 12, Mich.* For use as a coolant-lubricant. Advantages: stable emulsion over wide temp range, rapid emulsification with hard water, low surface tension providing high penetration around cutting edge of tool, rust-inhibiting even with dilutions of 200:1.

OIL COMPOUND—*Van Straaten Chemical Co, 546 W Washington Blvd, Chicago, Ill.* Developed to eliminate need for side clearance on cutting saws and increase efficiency of high-speed slotting operations. Vantrol 5468A.

METAL-CUTTING AGENT — *The Metalloid Corp, Huntington, Ind.* Solubilized organic condensate functioning on Dynatomics heat-limiting principle; usable with water and oil diluents for all machining and grinding operations. Claimed to increase tool life from 200 to 500%, to increase grinding wheel life at least 100% and give 3 to 5 times more pieces per dressing over straight oil. Metalloid WOS.

CUTTING OILS—*Sun Oil Co, Philadelphia 3, Pa.* Four cutting oils said to keep parts and tools up to 50 F cooler. Sunicut 11-S and 209-S are for medium and heavy-duty work on automatic screw machines; 102-S and 110-S for heavy-duty screw machine work and such operations as broaching, tapping, and threading.



OIL MIST CONTROL UNIT—*Westinghouse Sturtevant Div, 200 Readville St, Hyde Park, Boston, Mass.* 600- or 1200-cfm units recover coolant oil from mist generated by high-speed cutting, grinding, and milling operations.

COOLANT CLARIFIER — *Honan-Crane Corp, 701 Indianapolis Ave, Lebanon, Ind.* Multiple-tube filtering unit has 16,000 sq in. of filtering area to remove solid contaminants from water-base and mineral oil coolants. Self-cleaning tubes are suspended vertically.

WAX COOLANT—*Industrial Products Dept, S C Johnson & Son, Inc, Racine, Wis.* Wax-fortified water emulsion said to have exceptional lubricating properties and to minimize heat at source. Sold as a concentrate. No. 130.

COOLANT TUBE—*Acrobat Co, Los Angeles, Calif.* Made of Neoprene; twists into any shape. Tubes need not be wired or taped into position. Available in most diameters and lengths, with any length tip.

COOLANT—*Air Conversion Research Corp, 4107 N Damen Ave, Chicago 11, Ill.* Lubricates and dissipates heat in all metal-cutting operations; designed for use with Goodyer Pur-O-Luber. Large molecules in the structure are said to impart the high film strength.

CUTTING FLUID—*Lubricants, Inc, 1320 Oakman Blvd, Detroit 6, Mich.* Water-soluble; for all production machining and grinding operations. Said to be particularly useful as broaching lubricant. Tuff-Kut 77.

CUTTING OIL—*Magnus Chemical Co, Inc, South Ave, Garwood, NJ.* Non-sulfur; suitable for copper, copper alloys, and tough alloy steels on both machining and drawing. Said to double die life and eliminate seizures. Type DO-2A.

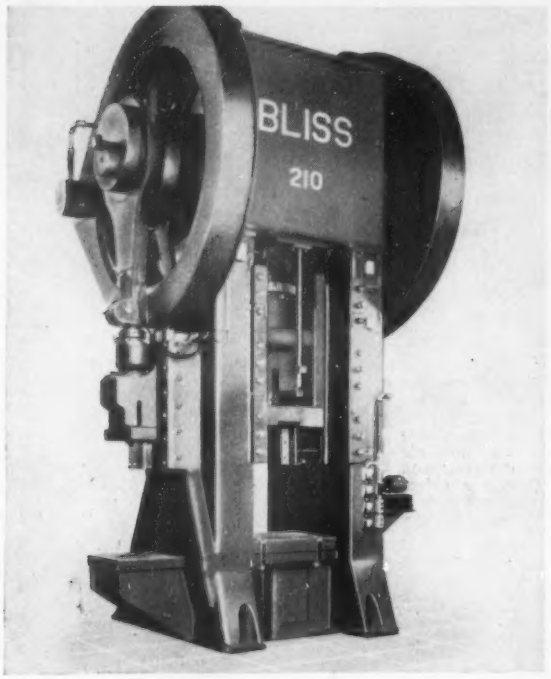
CUTTING OIL—*D A Stuart Oil Co, Ltd, 2727 S Troy St, Chicago 23, Ill.* Soluble-base oil for metal cutting and grinding. Mixtures start at 40:1 for machining operations; grinding mixtures leaner than 100:1 have reportedly been successful.

CUTTING COMPOUND—*Magnus Chemical Co, Garwood NJ.* Developed to reduce downtime on broaching operations caused by necessity of cleaning broaches. Compound No. 8.

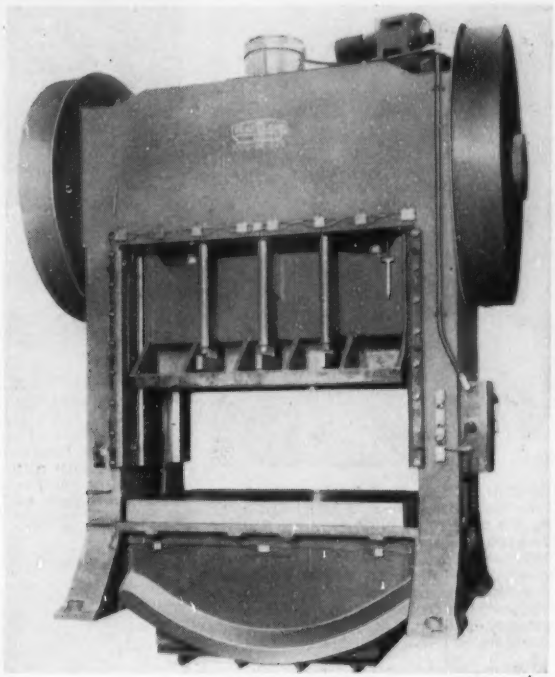
1954 AMERICAN PRODUCTION PREVIEW AND MACHINE TOOL ALBUM

FORMING, FORGING, CASTING

summarized from descriptions published during 1953

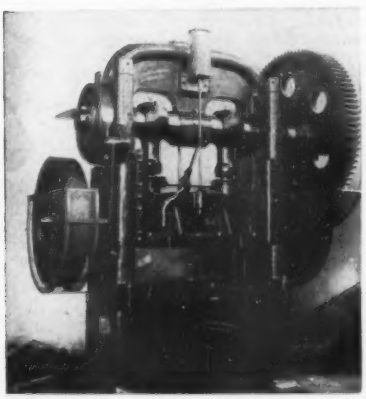


TRIM PRESSES—*E W Bliss Co, Canton, Ohio.* Designed for rigidity and quiet operation; incorporates air-counterbalance, automatic lubrication, and friction clutch. Operating at 35 spm, press has ram capacity of 440 tons; slide has 16-in. stroke with 6-in. motorized adjustment; trimming attachment has 10-in. stroke with 4-in. adjustment.

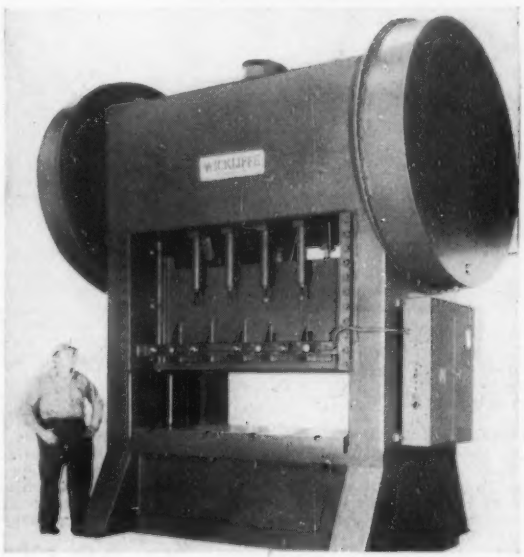


DOUBLE CRANK PRESS—*The Cleveland Punch & Shear Works Co, Cleveland 14, Ohio.* Capacity is 525 tons; stroke, 16 in.; distance from bed to slide, 32 in. Straight-sided press has double-geared twin-drive and is equipped with two-station, electrically controlled, air-operated drum-type clutch with spring-loaded brake.

POWER PRESSES—*Famco Machine Co, Kenosha, Wis.* Capacity of 13 tons; equipped with electrical or mechanical nine-point jaw clutch. Adjustable for continuous or single-stroke action. Model 56.

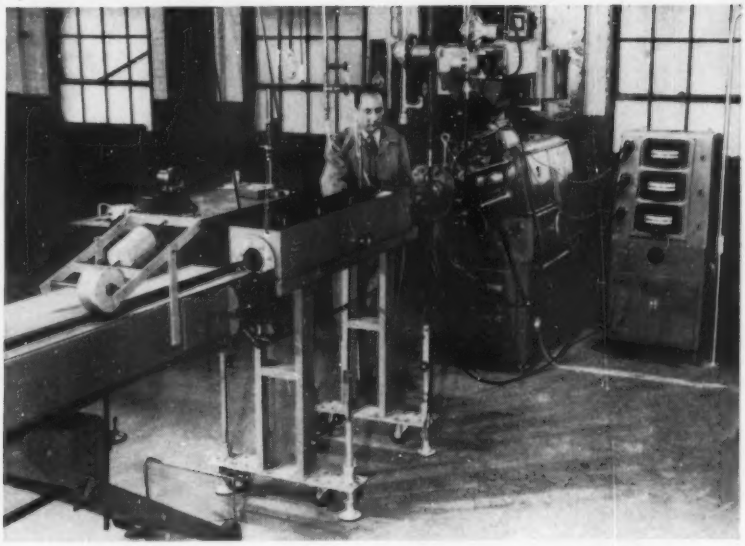


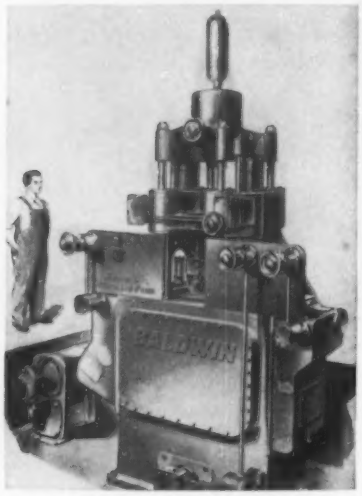
DOUBLE CRANK PRESS—*Zeh & Hahnemann Co, 182-200 Vanderpool St, Newark 5, N.J.* Back-geared; arranged for motor drive; capacity of 150 tons. Air cylinders balance slide. Standard stroke is 4 in. Max stroke is 10 in. No. 12-12B.



MECHANICAL PRESSES — *The Cleveland Crane & Engineering Co, Wickliffe, Ohio.* New line from 160 tons and up for forming, blanking, piercing, trimming, and drawing operations. Frames are straight-sided; all members are box-type. Feature air-operated clutch and brake, full pushbutton control.

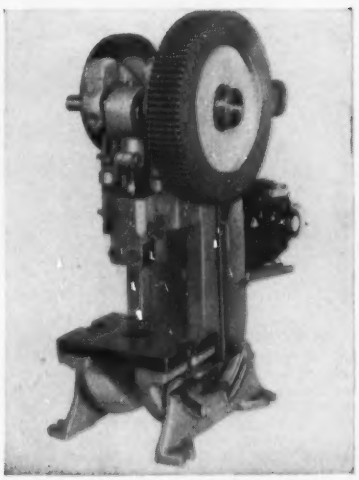
EXTRUDING MACHINE—*F J Stokes Machine Co, 5500 Tabor Road, Philadelphia 20, Pa.* For thermoplastic pipe materials. Includes extruder, dies, cooling unit, pulling mechanism, and either manual or automatic cutoff saw. Capacity to 6-in. dia with wall thickness of 0.050 or less.

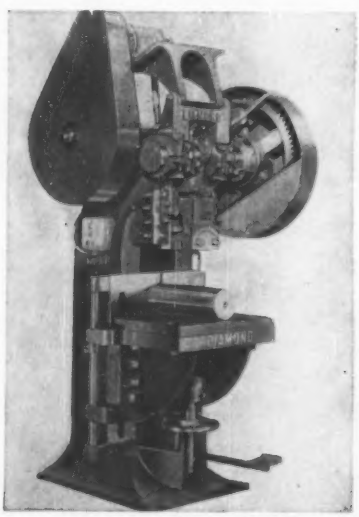




COMPACTING PRESS — *Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* Four-column unit equipped with flywheel, pneumatic clutch, and brake. Press mechanism is completely enclosed. Rated pressure is 100 tons, ejection capacity, 30 tons. Ejection stroke is adjustable from 0 to 6 in.; size of die opening is 6 in.; strokes per minute range from 4 to 24. Model C.

CLUTCH EQUILIBRATOR—*Diamond Machine Tool Co, 5111 Coffman-Pico Rd, Pico, Calif.* Equipment for Multi-Max presses and shears. Two-part unit consists of heart-shaped cam and air chamber with automatic pumping and regulating mechanism. Device counterbalances punch and die plates and acts as brake.





HORN PRESS — *Diamond Machine Tool Co, 5111 Coffman-Pico Rd, Pico, Calif.* Plain or geared. Capacity 40 tons; die height 6 to 18 in.; stroke 3 to 6 in.; speed 50 to 100 spm.

LIGHT PRESS—*Winter Products, Inc, Box 5112, Barnum Station, Bridgeport 5, Conn.* Redesign provides increased impact, cleaner design, and mechanical simplification. Impact ranges from 0 to 12,000 lb and squeeze can be up to 12 times airline pressure. Model RR-7.

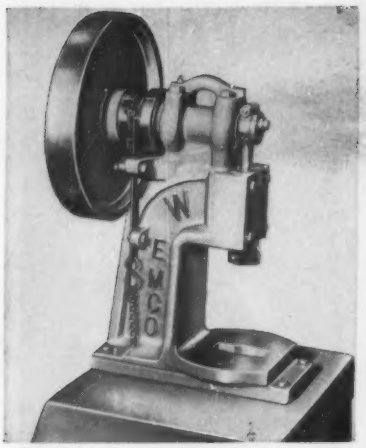
PUNCH PRESS—*Benchmaster Manufacturing Co, 1835 W Rosecrans Ave, Gardena, Calif.* Stub-tooth backgears reduce speed range from 40 to 100 spm. Designed for drawing, forming, and other operations requiring slow, powerful strokes. Available in 4-ton deep-throat, and 7½-ton standard models.

INCLINABLE PRESS—*Rahway Machine Tool Corporation, 1539 Elizabeth Ave, Linden, NJ.* Capacities are 300, 450, 600, and 1000 tons. Electro-pneumatic clutch allows press to be stopped at any slide position. Locking commutator permits descent of slide in small increments and stroke-by-stroke operation. This machine is one of a line of Spiertz presses, shears, and brakes handled by Rahway. French—Spiertz.

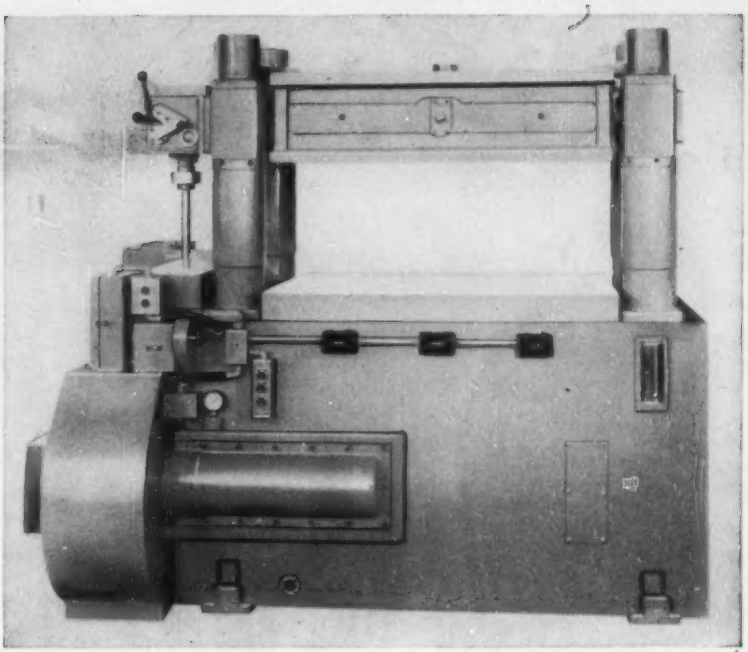
POWER PRESS—*Morey Machinery Co, 410 Broome St, New York 13, NY.* Capacity is 15 tons; throat depth, 5¼ in. Stroke is optional in ½-in. steps from ½ to 2½ in. Safety guards are integral part of control mechanism. British.

PUNCH PRESS — *Dashew Business Machines, Inc, 1641 McGarry St, Los Angeles, Calif.* Central electronic control system provides both central cycling and timing mechanism as well as dual safety control. Capacity is 25 tons; operating rate 90 to 120 spm. Dashapress.

SAFETY GUARD—*Cooper Weymouth, 277 Noble Ave, Bridgeport 8, Conn.* For power presses with stroke up to 4-in.; composed of two guard arms actuated by ram to push hands away.

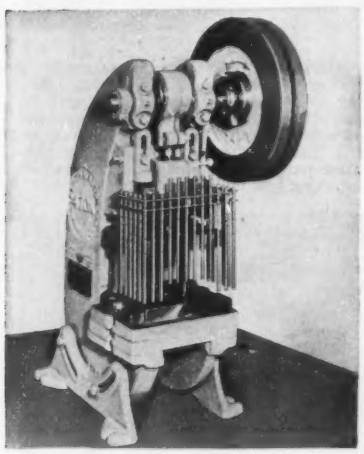


PUNCH PRESSES — *The Klaas Machine & Mfg Co, 314 E 49th St, Cleveland 9, Ohio.* Bench models afford increased die space by eliminating column radius. Model W has 5-ton capacity and speed of 300 rpm; standard stroke is ¾ and 1¼ in. Model X has 10-ton capacity with speed of 150 rpm; standard stroke is 1½ or 2 in.

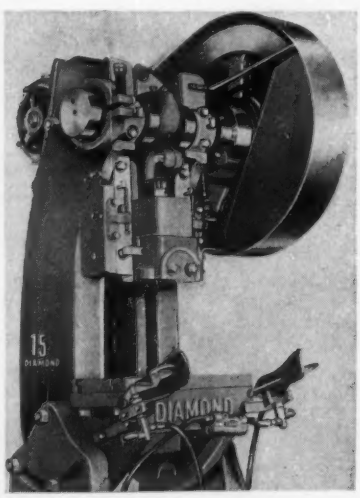


DIEING MACHINE—*Henry & Wright, Div. Emhart Mfg Co, Windsor St, Hartford, Conn.* Automatic with 350-ton capacity; takes metal up to 25 in. wide and 11/32 in. thick. Makes completely drawn and formed stamping in 13 operations by progressive die method. Strokes up to 60 in. can be provided.

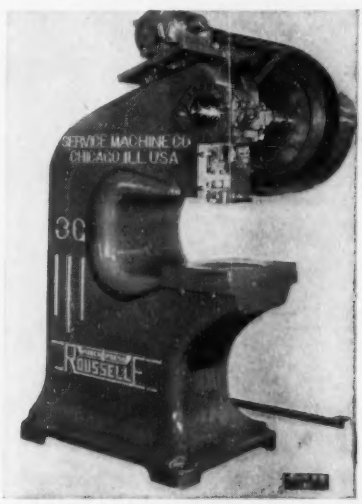
DIE TRYOUT PRESS — *Alpha Tool Works, 9281 Freeland Ave, Detroit 28, Mich.* Permits operator to barber, spot, shear, fit and finish both punch and die without removing die from press. Electrical controls permit inching single-stroke, continuous operation, and forward or reverse. 100 ton capacity; 6-in. stroke; 50 spm.



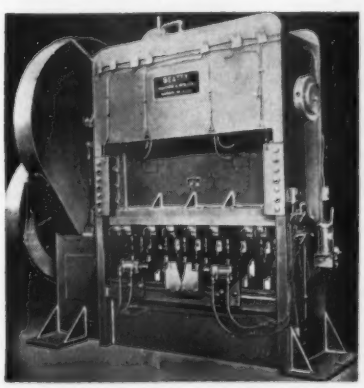
PRESS SAFETY GUARD — *Benchmaster Manufacturing Co, 1835 W Rosecrans Ave, Gardena, Calif.* Barrier-type; designed to provide max safety regardless of die used. Contours of various shapes are formed by changing height and position of rods.



PUNCH PRESS—*Diamond Machine Tool Co, 3429 E Olympic Blvd, Los Angeles 23, Calif.* Redesigned 15-ton open-back inclinable punch press has shut die height of 9 in. Standard stroke is 2 in. Continuous or single-stroke operation.

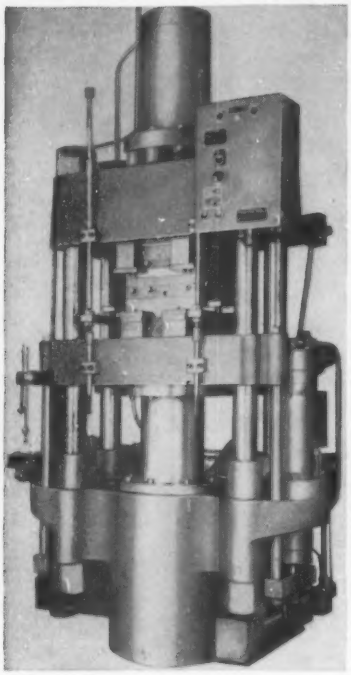


PUNCH PRESSES—*Service Machine Co, 7625-35 S Ashland Ave, Chicago 20, Ill.* Line includes horn, deep-throat, and open-back inclinable presses with capacities from 5 to 40 tons. Automatic knockout bar and single-stroke clutch are standard on all units.

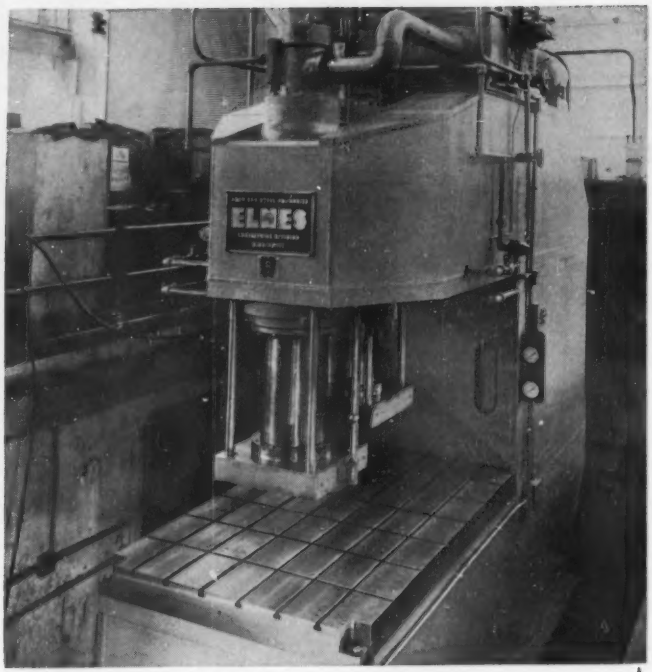


GUILLOTINE PUNCH—*Beatty Machine & Mfg Co, Hammond, Ind.* Furnished with tools and positioners, has 250-ton capacity. Punches angles, webs of sections, or flat plates. Stroke is 2½ in. Model No. 10.

RADIOACTIVE WRISTBANDS—*Modern Air Corp, 400 Preda, San Leandro, Calif.* Safety device for punch press operator locks press by activating Geiger tube when hands are in danger zone. Timer makes press inoperative about 15 sec after stock is removed. Price: $160.

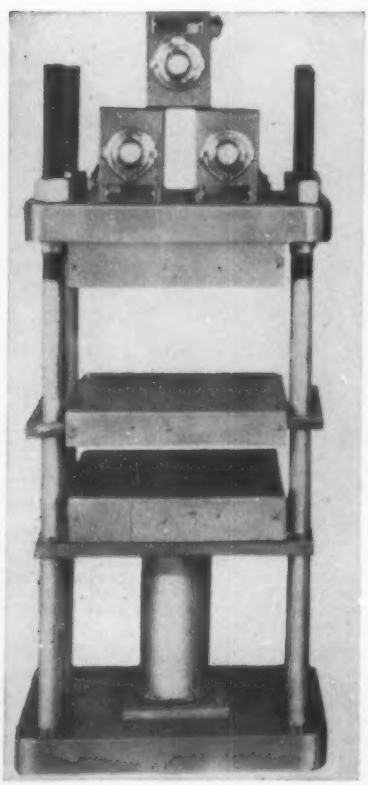


HYDRAULIC PRESSES — *Logan Engineering Co, 4901 W Lawrence Ave, Chicago 30, Ill.* Primarily for plastic or rubber molding; pressure range from 20 to 400 tons.

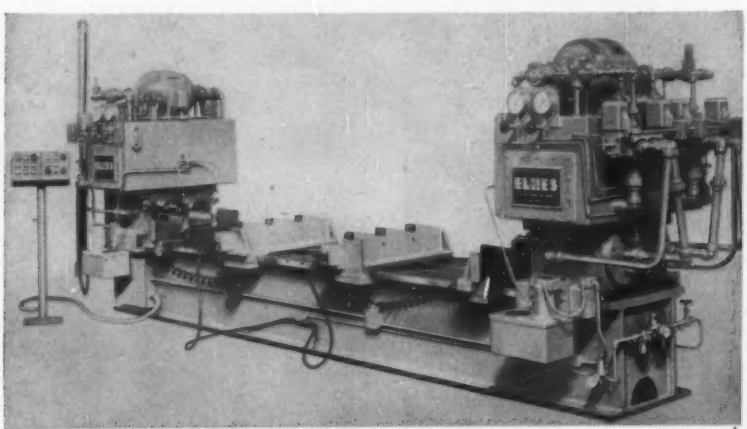


SELF-ALIGNING SUBPRESS — *Price Machine Products, 929 W 80th St, Los Angeles, Calif.* For use with kick, arbor, air, or punch presses. Eliminates complicated setups for staking, piercing, bending, and assembling operations on small parts.

HYDRAULIC PRESS—*American Steel Foundries, Elmes Engineering Div, 1150-A Tennessee Ave, Cincinnati 29, Ohio.* 600-ton flanging press is designed so each 300-ton cylinder can be operated independently. Control is provided through single pendant station operating on swivel.



COLUMN PRESS — *Mead Specialties Co, Dept CP-4, 4114 North Knox Ave, Chicago 41, Ill.* Single- or double-acting, 3- or 4-in. bore. Single-acting cylinders have max stroke of 4 in.; double-acting cylinders have any length of stroke from 0 to 36 in. Upper ram of double-acting models have depth-stop nut and collar.

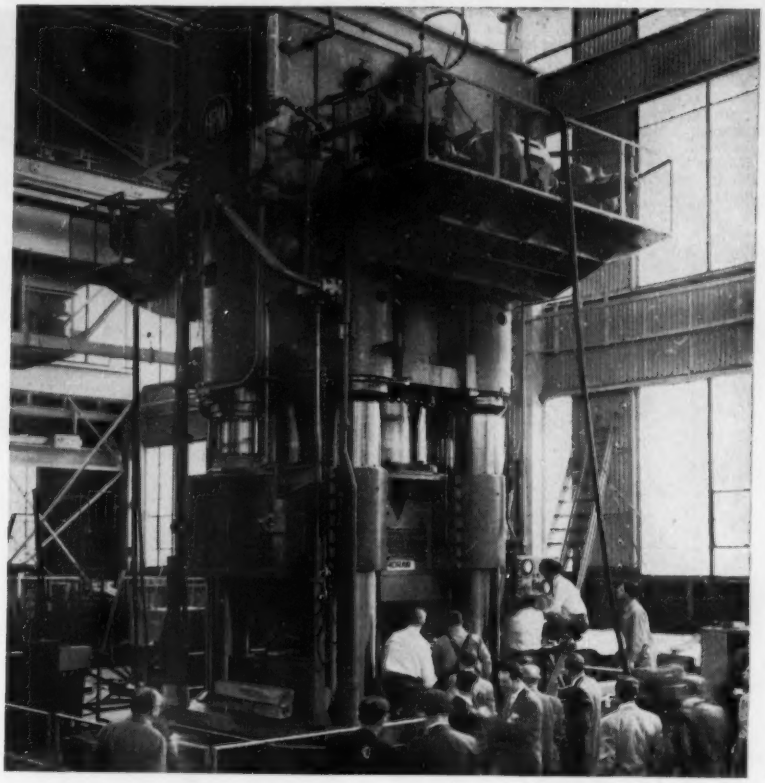


HYDRAULIC PRESS—*American Steel Foundries, Elmes Engineering Div, 1150-A Tennessee Ave, Cincinnati 29, Ohio.* Reduces both ends of tube simultaneously; accommodates tubes varying in length from 3 to 12 ft in ½-ft increments. Machine has two stations and uses preliminary-reduction die. Tubes are fed automatically through the machine. Capable of producing 150 tubes per hr.

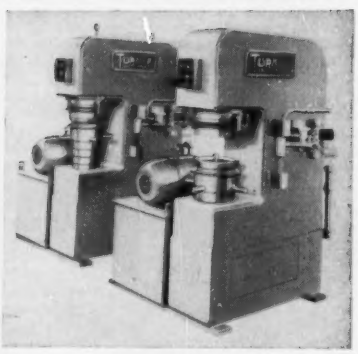
← HYDRAULIC PRESS—*M & N Hydraulic Press Co, 780 Route 3, Allwood, Clifton, NJ.* Capacity is 10, 20, 30 tons; platens are electrically heated and thermostatically controlled up to 450 F. Cylinders are built for 3000-psi operation.

GAP PRESS—*Studebaker Machine Co, 1221 S 9th Ave, Maywood, Ill.* Designed for fast operation on such jobs as forming, drawing, riveting, piercing, crimping, and staking. Capacity is 20 tons; gap is 10 in. Model 220G.

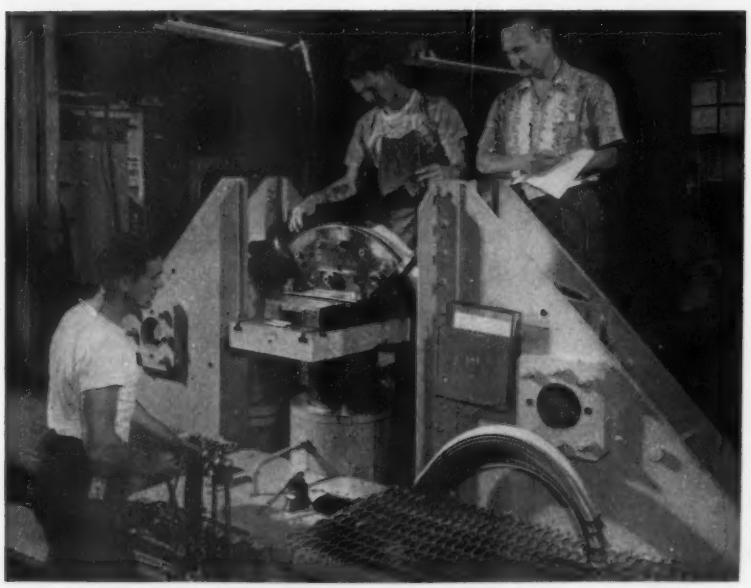
DEEP-DRAWING PRESSES — *The Hydraulic Press Manufacturing Co, Mount Gilead, Ohio.* Capacity from 1000 to 7000 tons. Handles Hidraw (deep drawing metal parts by combination cushion and rubber pad process) and Guerin process. Pressure in hydraulic cushion is adjustable to preset stroke pattern.



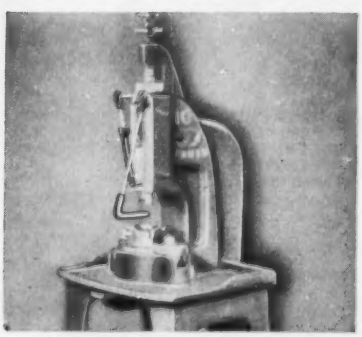
HYDRAULIC PRESSES — *Greenerd Arbor Press Co, Nashua, NH.* Four-posted presses in 50- and 75-ton models. Ram speeds are 92 and 30 ipm; return speed is 150 imp. Rapid traverse operates at 1000 psi.



ASSEMBLY PRESS — *Turner Bros, Inc, 2625 Hilton Rd, Ferndale, Mich.* Hydraulic press designed for accurately maintaining center distances in assembling inner portions of fluid couplings.

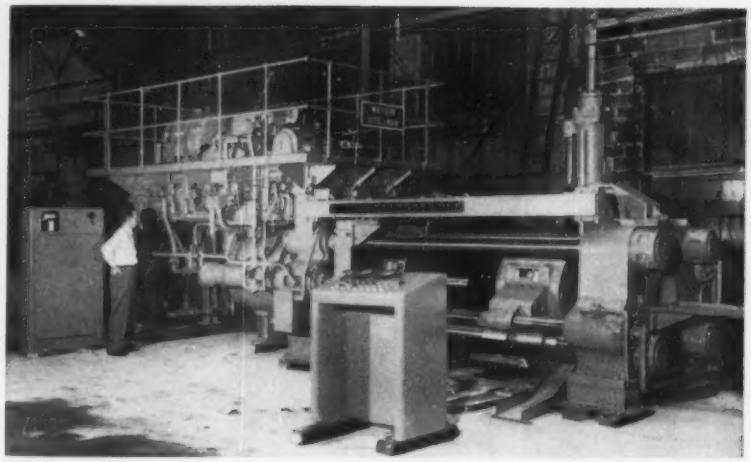


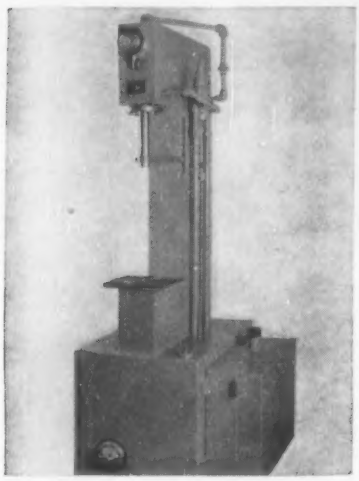
STRETCH-FORM PRESS — *Longren Aircraft Co, Torrance, Calif.* 100-ton hydraulic press stretch-forms aluminum alloy to 3 sq in. in cross-section and 72 in. in width. Extrusions or sheets up to 16 ft in length and extrusions up to 6 in. in width can be contour-formed.



PRESS GUARD — *Searjeant Metal Products, Inc, 77 Pittsford Rd, Mendon, NY.* Sweep arm works with downward motion or ram—sweeps completely beyond press-feed area on first half of stroke. Installation requires drilling and tapping only one hole in bottom of ram.

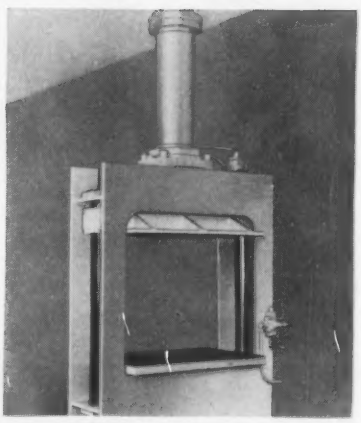
EXTRUSION PRESS — *The Watson-Stillman Co, Div of H K Porter Co, Inc, Roselle, NJ.* Hydraulically operated, 1250-ton capacity press for extruding aluminum. Long-stroke design of main cylinder permits loading billet and dummy block into container on single forward stroke of main ram. Ram moves at rate of 8 ips and loads 24-in. billet and dummy block in four seconds.





HYDRAULIC PRESSES—*Clifton Hydraulic Press Co, 287 Allwood Rd, Clifton, NJ.* Line includes dual-pump hydraulic presses, down-acting production presses, and various self-contained hobbing presses which feature Unitrol —a complete hydraulic circuit eliminating two-hand control and regulating both pumps.

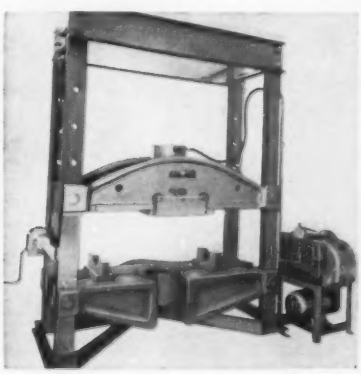
TUBE-EXPANDER — *Walter P Hill Inc, 22183 Telegraph Rd, Detroit 19, Mich.* Hydraulically powered; one set of 60 mandrels expands copper tubes 0.020 in.; another set sizes ends for soldered return-bend fittings. Cycle time, including loading, expanding, sizing, and unloading, is 40 sec.



COMPRESSION PRESS — *Sheridan-Gray Inc, 405 Via Chico, Palos Verdes Estates, Calif.* Provides 24x36-in. platen with 50-ton capacity and 30-in. stroke. Can be operated in multiple from central pumping unit.

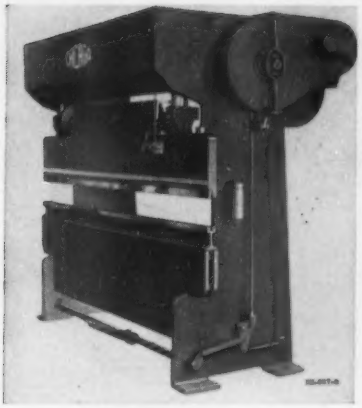
HYDRAULIC PRESS—*Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* 17½-ton shop press equipped with Power-Twin ram which can be detached and used as portable unit. Hydraulic hand pump develops 10,000 psi. Model Y106A.

HYDRAULIC RAMS—*Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* Adapted to OTC push-puller. Capacity ranges from 17.5 to 50 tons.

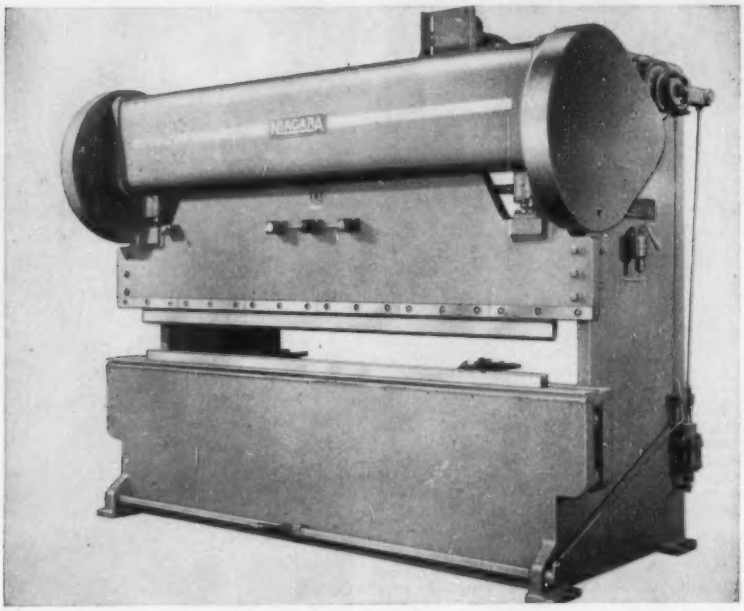


OPEN-YOKE PRESS — *Rodgers Hydraulic, Inc, 7450 Walker St, St Louis Park, Minneapolis 16, Minn.* Incorporates features of standard shop presses, handles most work done on forging presses, and, because of fully machined yoke bed, can be used as platen press. Capacities are 100, 200, 300, and 400 tons.

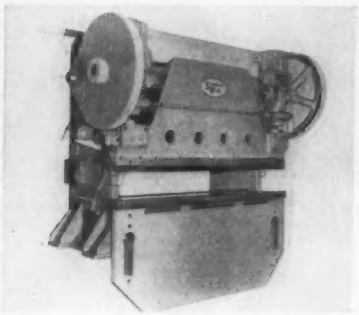
OPEN-THROAT PRESS — *Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* 30-ton capacity. Hydraulic ram can be quickly detached from press for use with pullers and push-pullers.



PRESS BRAKE — *Dreis & Krump Manufacturing Co, 7400 S Loomis Blvd, Chicago 36, Ill.* Three sizes have capacities ranging from 54 in. by 10 gage to 120 in. by 16 gage. Each size has 3-in. stroke, 3-in. ram adjustment, 12-in. die space, and infinitely-variable-speed drive from 20 to 50 sfpm. Series A.



PRESS BRAKES—*Niagara Machine & Tool Works, 637-697 Northland Ave, Buffalo 11, NY.* For bending, curling, jogging, corrugating, notching, and punching. Laminated non-metallic ways; double-reduction gearing; double-end twin drive; air-cooled clutch and brake. Capacities of 50, 100, and 150 tons.

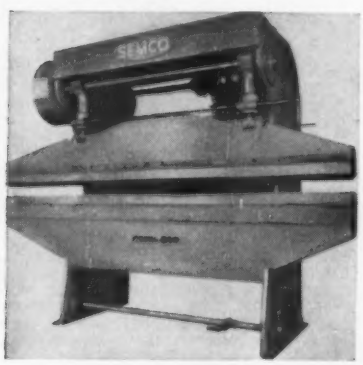


PRESS BRAKE — *Struthers Wells Corp, Machinery Div, Titusville, Pa.* Forms steel up to ¾-in. thickness and 8-ft width; capacity is 400 tons. Pneumatic clutch, separate brake, operating controls for cycling and inching, and control for single work stroke with return. Model 400-PB-8.

PRESS BRAKES — *Service Machine Co, Inc, 226 Miller St, Elizabeth NJ.* Capacities of 6 and 8 ft with ram and bed plate lengths of 72 and 96 in. Shut height is 12 in.; stroke, 3 in.; stroke adjustment, 4½ in. Speed range is 16 to 40 spm. Price: $2975 and $3175.

CLUTCH CONTROL — *Minneapolis-Honeywell Regulator Co, Micro Div, Freeport, Ill.* Two-hand control for manually operated power presses. Two control switches must be pressed down simultaneously to operate press.

PNEUMATIC DIE CUSHION—*Dayton Rogers Manufacturing Co, Minneapolis, Minn.* Designed primarily for inclinable presses. Internal guiding method compensates for off-centering loading of pin pressure pad. Sizes from 5 to 18 in. produce holding pressures from 1 to 14 tons on 100-psi pressure.



PRESS BRAKE—*Service Machine Co, Inc, Elizabeth, NJ.* Eight-foot model has 3-in. stroke, ram adjustment of 4½ in., and is capable of 16 to 40 spm. Bending capacity for 16 gage is 96 in. Model 800.

AIR IMPACT PRESS—*Cadillac Stamp Co, 17315 Ryan Rd, Detroit 12, Mich.* For high-speed marking, staking, and riveting. Speeds up to 10,000 strokes per hr; pressure up to 8 tons. Model 52.

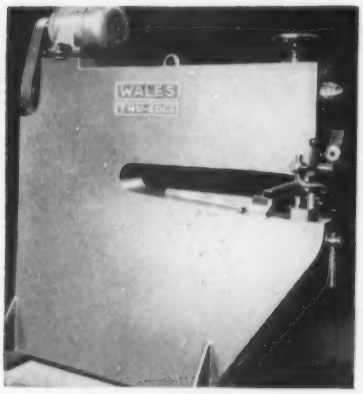
PRESS CONVERTER—*Price Machine Products, 929 W 80th St, Los Angeles 44, Calif.* Air conversion unit replaces ram of its corresponding hand-operated arbor press and converts it into air press. Units have power factor of 12.5 or 19.6.

ARBOR PRESS—*Manzel, 315 Babcock St, Buffalo 10, NY.* 10-ton capacity for straightening, testing, bending, or removing bushings or bearings.

PNEUMATIC IMPACT PRESS—*Heidrich-Nourse Co, 631 East Third St, Los Angeles 13, Calif.* Delivers any force from 30 to 30,000 lb. Length of hammer stroke is adjusted by large hand nut at top; airflow occurs only during operating cycle.

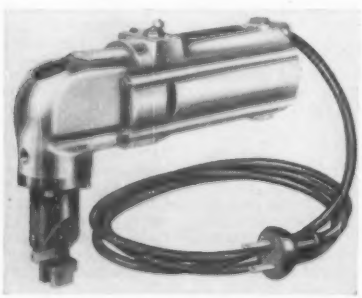
BRAKE CONTROL—*American Actuator Corp, 40 Hudson St, New York 13, NY.* Ram can be set to stop automatically at any point on downstroke by knob adjustment. Consists of four components: control panel, solenoid, foot switch, and automatic switchbox tied in with stroke of ram.

LABORATORY CRUSHER — *Denver Equipment Co, Box 5268, Denver 17, Colo.* 3¼x4½-in. forced-feed jaw crusher operates between 350 and 425 rpm and is powered by 2-hp motor. Capacity for ¼-in. material is 500 lb per hr.

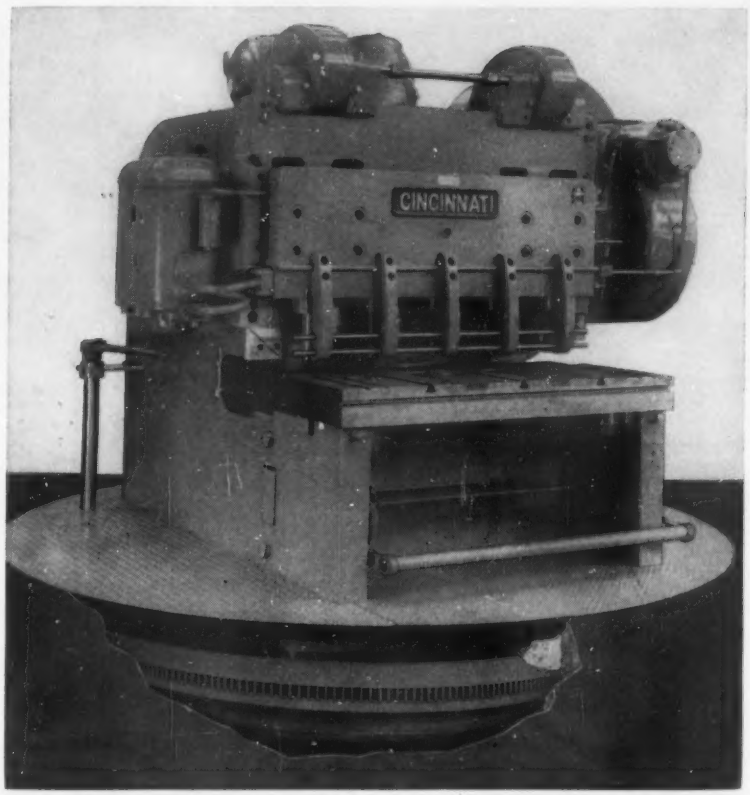


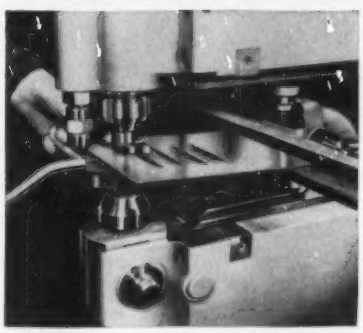
SHEAR — *Wales-Strippit Corp, 545 Payne Ave, N Tonawanda, NY.* Designed for straight and contour inside and outside shearing, beading, louvering, and joggling. Capacity is up to 9/32-in. mild steel. Throat depth is 36½ in. Cutting rate from 10 to 36 fpm.

POWER NOTCHER — *O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Operates at 180 spm to cut notches as large as 6x6 in. in 16-gage sheet steel. Adjustments will allow notches larger or smaller than 90°, as well as straight shearing. Foot-actuated clutch with single-stroke action. Price: $640. Di-Acro.

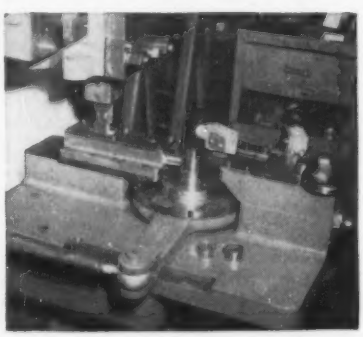


NIBBLER—*Fenway Machine Co, Inc, Philadelphia 3, Pa.* New model has greater rigidity because of nosepiece with punch and die arrangement for cutting metals, including stainless, up to 14 gage. Can be used as hand or vise-mounted tool.





LOUVERING ATTACHMENT—*American Pullman Co, Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Special tools for Pullmax sheet- and plate-making machine permit cutting and forming of louvers in steel and non-ferrous metals in single operation.



STEEL SHEAR — *The Cincinnati Shaper Co, Hopple, Garrard, & Elam St, Cincinnati 25, Ohio.* Cuts mild steel up to 1 in. thick and 4 in. long; operation rate is 30 spm. Shear is mounted on turntable rotated by circular rack and pinion.

POWER NIBBLER — *Nord International Corp, PO Box 44N5, Denville, NJ.* Nibbles, beads, and folds, cuts straight or circular lines, slots, and louvers. Tool changing is said to be exceptionally easy. Cuts 3/32-in. cold-rolled steel, 5/32-in. brass or copper. Circle cutting diameters range from 2-23/64 to 28½ in.

DIEMAKING MACHINE—*Craftsmen Machinery Co, Boston, Mass.* Combines operations of steel rule bending, cutting, and notching as well as vertical circular rule cutting. Standard machine cuts notches ¾x⅝ in.; vertical cutter will cut inside 1½-in. circle.

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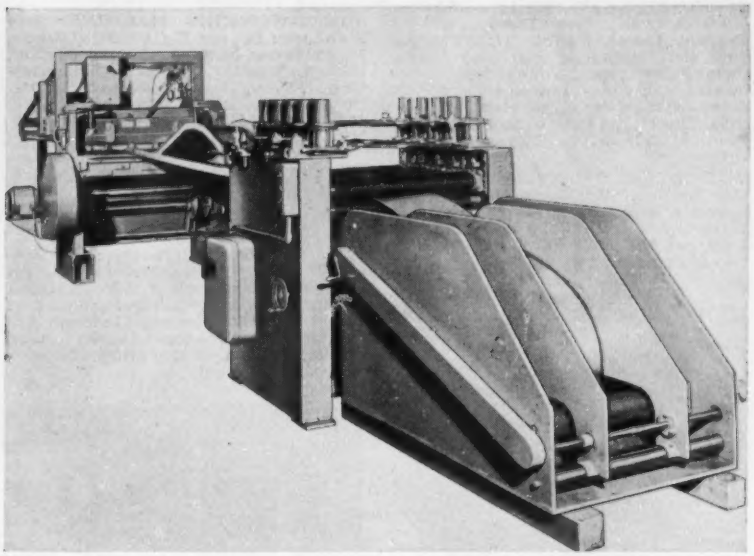
PIERCING ATTACHMENT—*V & O Press Co, Div, Emhart Manufacturing Co, Hudson, NY.* For use on power press to pierce cage of needle bearings. Pierces 19 rectangular holes in tubing 0.025 in. thick at speed of 100 spm.

SHEET FABRICATOR—*Wales-Strippit Corp, 345 Payne Ave, North Tonawanda, NY.* Does punching, notching, and nibbling with rapid interchangeability of attachments. Hydra-New-Matic head has been redesigned to operate at 165 spm with minimum vibration and noise. Model 10-AA.



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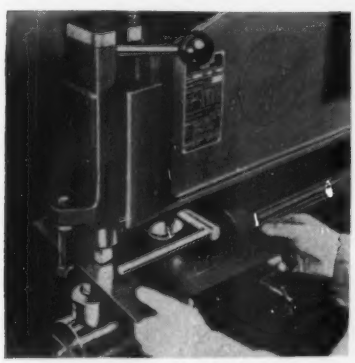
DE-COILER, SHEARER—*Union Tool Corp, Warsaw, Ind.* De-coils, levels, shears, and stacks any flat material automatically. Handles steel coils up to 13 gage, widths from 6 to 60 in. Operating speed up to 150 sfpm.



HOLE-PUNCHING PROCESS — *Federal Tool & Manufacturing Co, 3640 Alabama Ave, St Louis Park, Minneapolis, Minn.* Holes of varying dia can be punched simultaneously from any stampable material. Sizes from 1/16 to ½ in.

RUBBER CENTERING DEVICE — *American Pullmax Co, 2455 N Sheffield Ave, Chicago 14, Ill.* For cutting circles, with company machines, from stainless steel and brass without using center mark.

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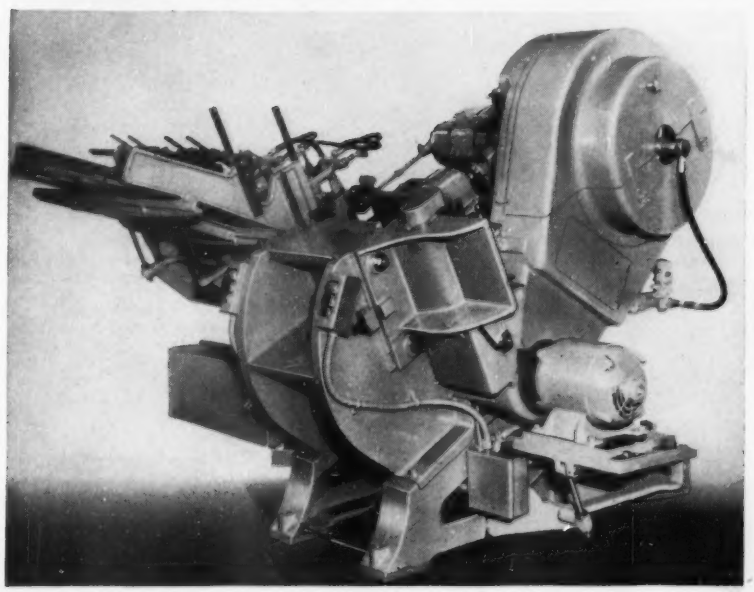
CONTOUR SHEAR — *Wales-Strippit Corp, 345 Payne Ave, N Tonawanda, NY.* For inside cutting, beading, and forming of sheet steel. Requires no starting holes. Throat depth 48 in.; speed from 10 to 36 fpm; capacity to 10-gage mild steel or 11-gage stainless.



SHEET METAL FABRICATOR — *Wales-Strippit Corp, 345 Payne Ave, N Tonawanda, NY.* For punching, notching, and nibbling. Throat depth with back gage is 27 in.; 30½ in. without. Punches and dies are automatically aligned by holder for holes to 3½-in. dia. Operating speed is 175 spm. Model 10-C.

PORTABLE POWER UNIT — *The Lockformer Co, 4615 West Roosevelt Rd, Chicago 50, Ill.* Attachment powers both 20-22 and 20-24 Lockformer slitting attachments. Eliminates need for periodic mounting and dismounting of slitter from chassis. Gear-drive unit operates in sealed oil bath. Price: $100.

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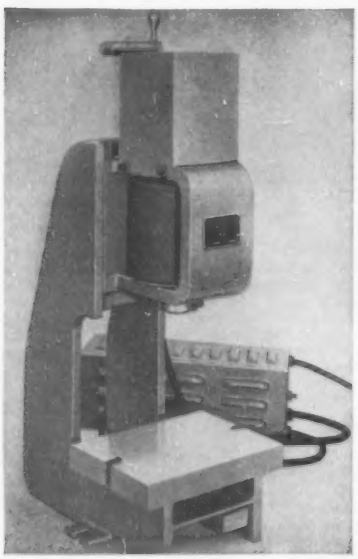
STRIP FEED PRESS—*Baldwin-Lima-Hamilton Corp, Hamilton, Ohio.* For high-speed production of can ends, screw caps, and other light stampings. Redesign has feed stack providing for 1-hr production run before reloading. Rating is 25 tons.

FORMING, FORGING, CASTING—brakes, shears, bending

STEEL BENDING ROLLS — *Niagara Machine and Tool Works, 637-697 Northland Ave, Buffalo 11, NY.* Produce true cylinders; roll oval forms, rectangular pipes, rounded-end containers, and cones. Power drive for all three rolls; power adjustment for rear rolls. Three sizes have capacity of 5/16x 48 in., 3/16x72 in., and 12 gage x 120 in.

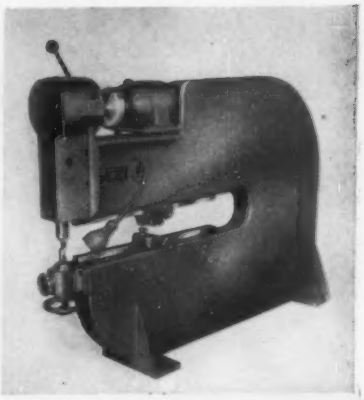
GUILLOTINE PUNCH — *Manco Mfg Co, Bradley, Ill.* Weighs 1650 lb and provides 75-ton thrust. Punch range is 13/16 to 1-¾ in.; operating cycle takes 3 sec per punch. Powered by 2-hp electric hydraulic pump unit.

SHEET METAL SLITTER — *Lockformer Co, 4615 W Roosevelt Rd, Chicago 50, Ill.* Handles up to 20-gage metal in lengths from 1 in. up, holding a tolerance of 1/32 in. on an 8-ft sheet. Equipped with mechanically operated back gage.

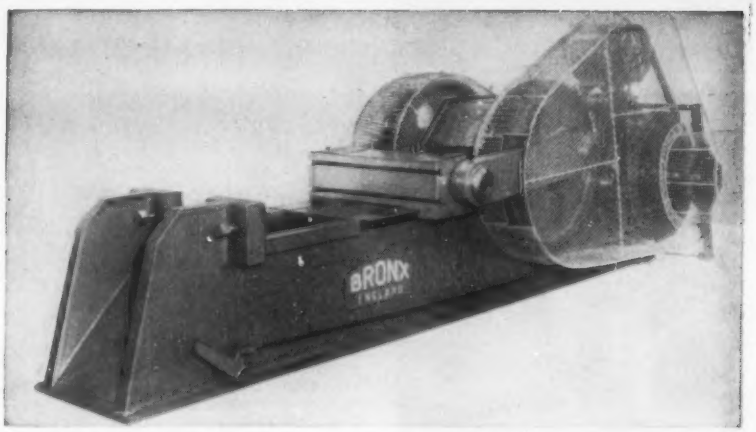


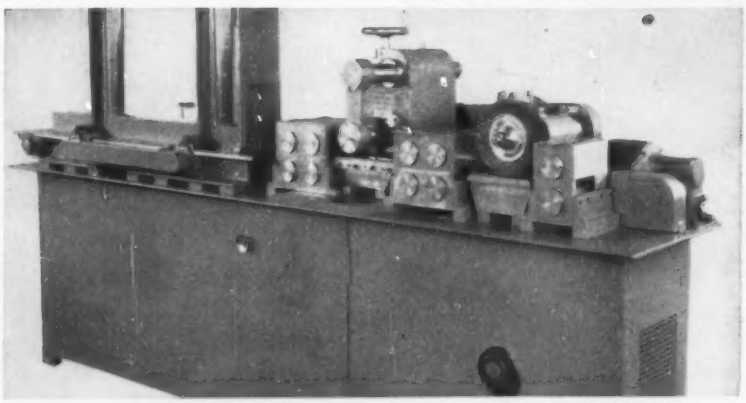
IMPACT HAMMER—*Black & Webster, Inc, Dept N 71, 445 Watertown St, Newton 58, Mass.* Electric; bench-model; for heavy-duty staking, crimping, punching, forming, riveting, and stamping. Force of impact is adjustable from a few pounds to 10,000 lb at rates to 75 spm. Shut height is adjustable from 1¼ to 6¾ in.; stroke length is 2 in. Unit derives power from special solenoid and incorporates selenium rectifier.

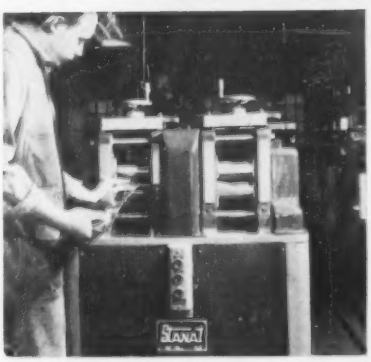
SHEET-WORKING MACHINE—*Eric S Johnson Co, 230 E Ohio St, Chicago, Ill.* Performs beading, straight cutting, folding, joggling, circle- and slot-cutting, nibbling, and free-hand cutting. Cutting capacity on three models: ⅛, 15/64, and 5/16 in. Swedish — G V Nibbler.



BULLDOZER — *International Machinery Div, British Industries Corp, 16½ Duane St, New York 13, NY.* Designed for forming and bending heated stock, but bed said to be rigid enough for cold forming. 100-ton capacity; 10-in. stroke; 15 spm. Series B100. British—Bronx Engineering.

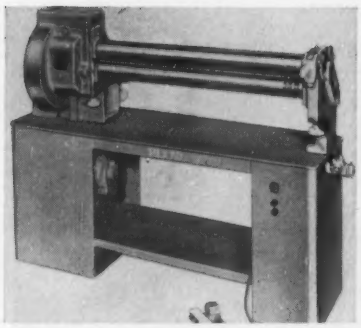




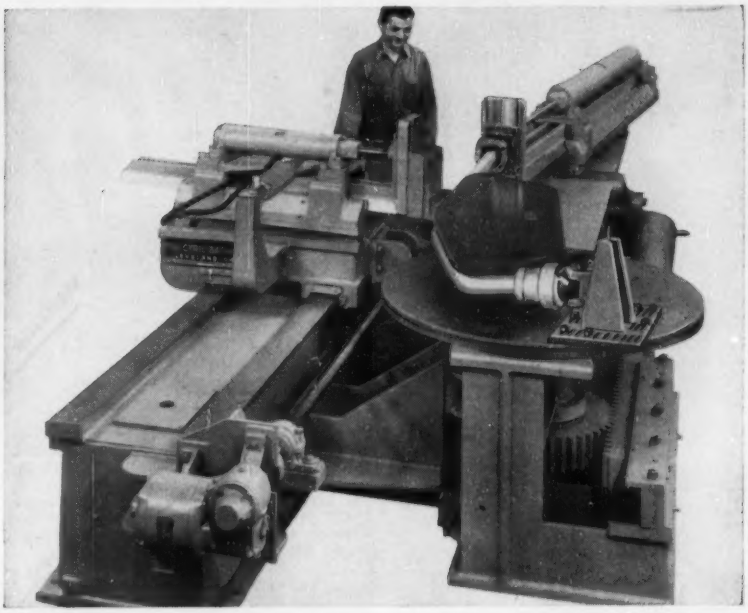


GROOVING MACHINE—*Central Machine Products Corp, 228 Pennsylvania Ave, Paterson, NJ.* Hopper-fed. Forms, mills, slits, or grooves strips of plastic, wood, aluminum, or fiber from ¼ to 3½ in. wide in thicknesses from 1/16 to ⅜ in. in lengths from 18 to 48 in.

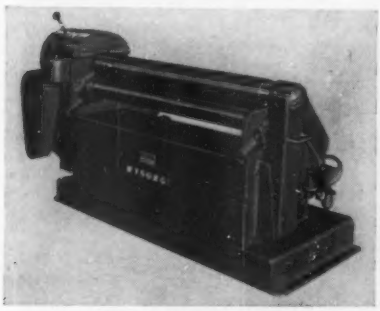
ROLLING MILLS — *Stanat Manufacturing Co, Long Island City, NY.* Interchangeable standard parts allow modification for rolling varied shapes of wire or flat stock. Capacity is 3 or 4 in. Also available are rolls that can be engraved and special rolls for hot rolling and mirror finishes.



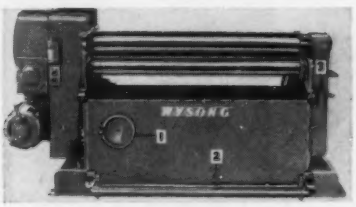
FORMING MACHINES—*The Peck, Stow & Wilcox Co, Southington, Conn.* Have rolls with 3-in. dia ranging from 36 to 48 in. in length; roll speed is 45 rpm. Powered third roll picks up stock from pinch rolls. Rear roll is grooved for easy start. Capacities are 14 to 16 or 16 to 18 gage. Also available are power squaring shears which handle stainless steel of 16-or 18-gage with cutting length of 48 or 72 in. at 62 spm.



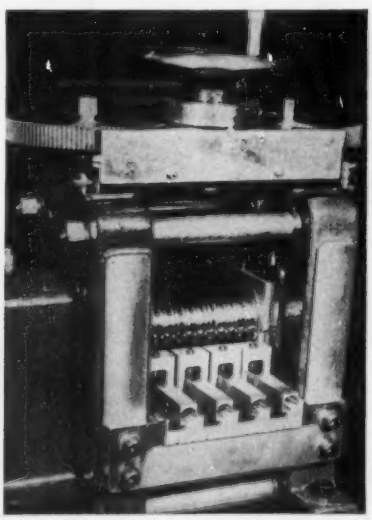
STRETCH FORMER—*Cyril Bath Co, Aurora & Solon Rds, Solon, Ohio.* Two related units: 5-ton stretch former and right-angle traversing unit that wipeforms the stretched metal on the die. Ram cylinder has 72-in. stroke. 48-in.-dia turntable rotates 210°; right-angle ram has 15° swivel each side of center.



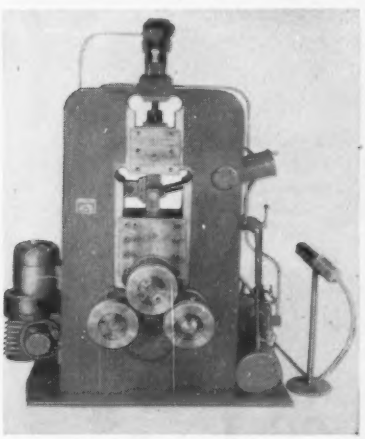
ALL-STEEL ROLLS—*Wysong & Miles Co, Greensboro, NC.* Line includes five sizes of 5-in. rolls of initial or pinch type. Top roll drops free to allow removal of formed cylinders. Sizes are 36, 48, 60, 72, and 96 in.



ROLLS—*Wysong & Miles Co, Greensboro, NC.* Redesign of 5-in. rolls has: fast parallel adjustment by single handwheel; full-length safety treadle; top-roll which rises automatically with lowering of drop-end.



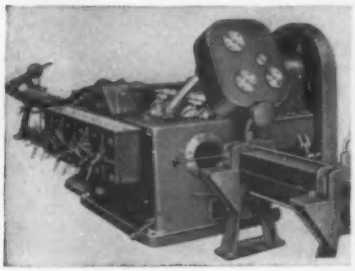
MODIFIED ROLLING MILLS—*Stanat Mfg Co, Long Island City, NY.* For tube reducing and sizing. Commonly used machines are the series 100 with 3-in. dia and 200 with 4-in. dia. Exit and entry guides are made in special sizes for various diameters of tubing.



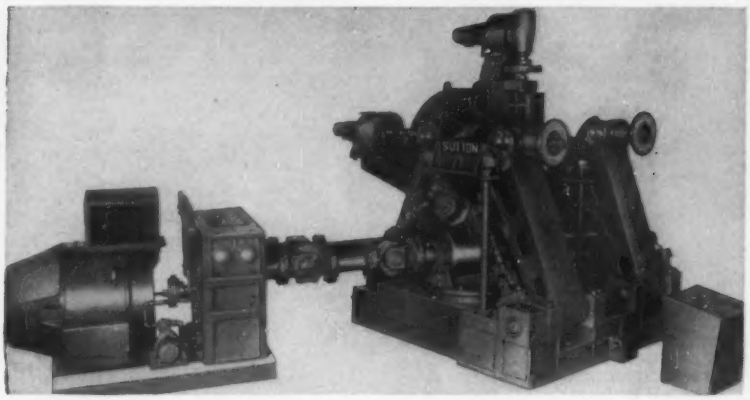
ROLLING MACHINE—*Wallace Supplies Mfg Co, 1300 Diversey Pkwy, Chicago 14, Ill.* Capacity for pipe or conduit is 1¼ to 3½ in.; for steel tubing, 1¾ to 4 in. Pitch roll attachment is placed on fixed roll to provide easy means of obtaining desired pitch. Reindexing is controlled by hydraulically actuated toggle mechanism.

HAND ROLLER—*O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Cam-idler design allows forming circles of any dia in two passes. Six new models have material capacity ranging from 16- to 24-gage sheet steel and price ranging from $110 to $355.

FLEXIBLE JAWS—*Hufford Machine Works, Inc, El Segundo, Calif.* For gripping and curving sheet metal to contour of die in stretch-forming operation. Composed of segments containing hydraulically actuated grippers. Adjustable setscrews establish degree of curvature.

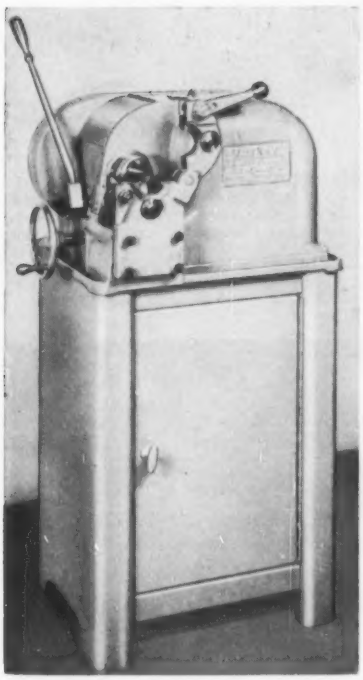


TUBE STRAIGHTENER — *Henry A. Spittler, 50 Church St, New York 7, NY.* Handles tubes with dia from ⅛ to 9⅞ in.; straightens entire length in one pass at rate of 165 fpm. German—Kieserling & Albrecht.

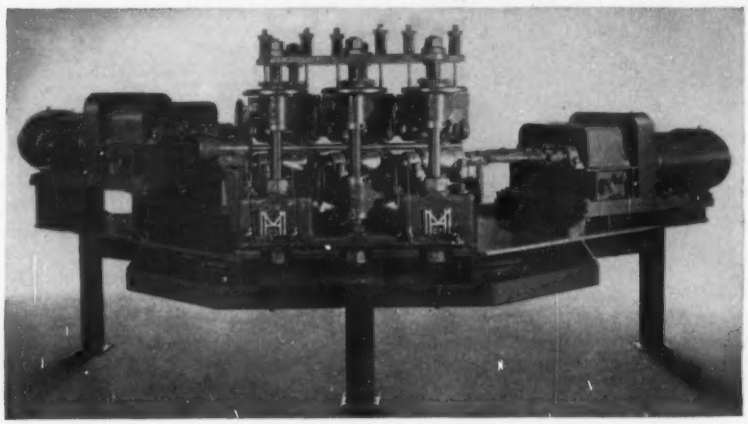


SEVEN-ROLL STRAIGHTENER — *Sutton Engineering Co, Bellefonte, Pa.* For tubes with OD from 3⅝ to 12 in. and bars with diameter from 3⅝ to 7½ in. Large driven roll with two idler rolls is located at entry end, similar cluster at delivery end. Between these is an unopposed pressure roll.

ROTARY STRAIGHTENER—*Mackintosh-Hemphill Co, 901 Bingham St, Pittsburgh 3, Pa.* Straightener, two 3-hp motors, and drive spindles are mounted on unit steel table. Incorporates circulating flood-lubrication system. Tube or pipe capacity is ¼- to ½-in. dia; production speed variable to 350 fpm. Model AX. ↓



TUBE-FLARING MACHINE—*Parker Appliance Co, 17325 Euclid Ave, Cleveland 12, Ohio.* Designed for high-volume production of 37° tube flares. Capacity includes standard wall thicknesses of tubes with OD from ⅛ to 2 in. made of annealed seamless copper, aluminum, steel, or stainless steel. With attachments, machine can be used for squaring and burring of tubes through same range. Operation is controlled by tube-size graduation on flaring center which is matched to index mark on spindle head.



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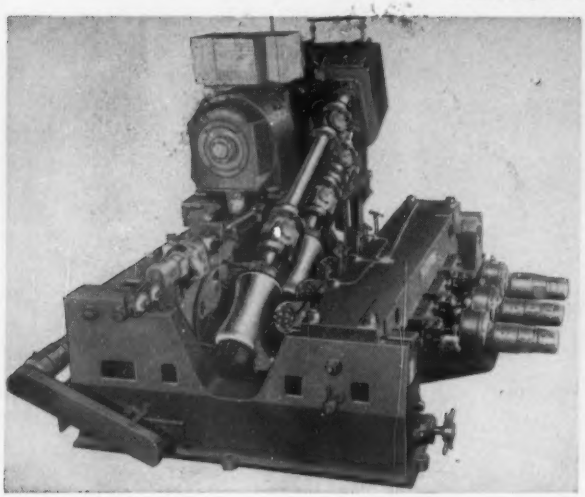
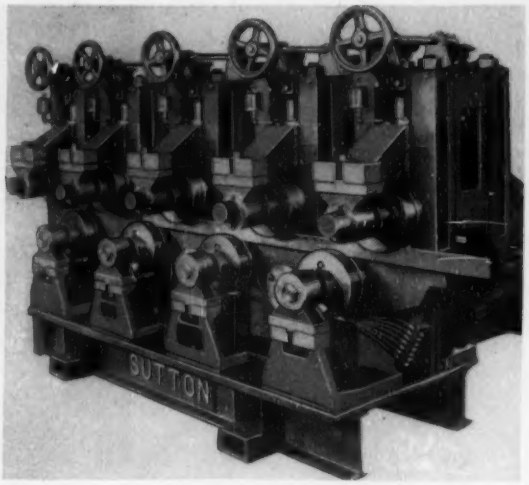
STRAIGHTENING PRESS — *Lempco Products Inc, Industrial Div, Bedford, Ohio.* For work from 1 to 10 ft long. Frame has underslung hydraulic pump and cylinder fastened to shaft by open-throat. Pressure is exerted along length until dial indicator shows same reading at each point.



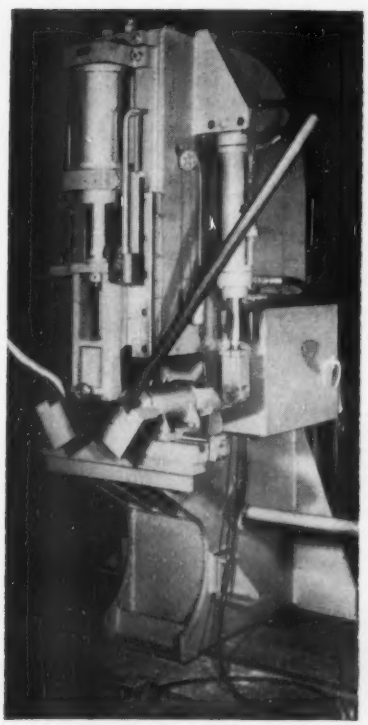
STRAIGHTENING MACHINE—*Sutton Engineering Co, Bellefonte, Pa.* For handling hot-rolled bars and heavy-walled tubes. Tubes from 1- to 10-in. OD and bars from 1- to 6½-in. dia can be straightened at speeds to 320 fpm. Operates on five-roll principle. All major adjustments are motorized.



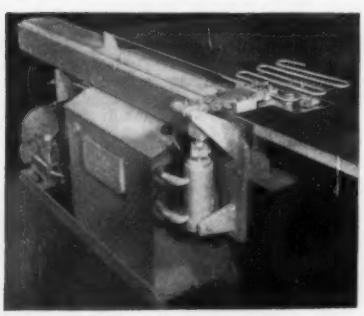
STRAIGHTENING MACHINE — *Sutton Engineering Co, Bellefonte, Pa.* Handles angle, channel, and T-shapes as well as squares and flats. Capacity is from a range of ½ to 2½ in. for flats to 4x4x3¾ in. for angles. Pass line consists of four bottom-driven rollers with five top-pressure rollers.

POWER BENDER—*O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Forms simple and complex bends in round stock, tubing, angle, channel, molding, strip stock, extrusions, and other ductile material. Features foot controls.

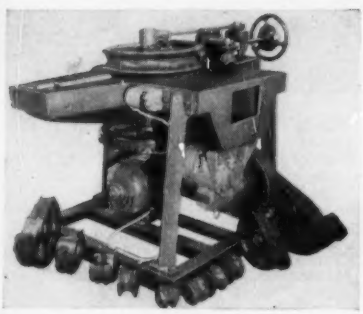
PORTABLE BENDER—*Wallace Supplies Mfg Co, 1300 Diversey Pkwy, Chicago 14, Ill.* Bends pipe from ⅛ to 1¼ in. IPS to 180° and averages 60 bends per hr with one operator. Skill drill-press ¾-hp motor supplies power. Wallace No. 60.



TUBE-BENDING PRESS—*Pines Engineering Co, Inc, 601 Walnut St, Aurora, Ill.* Vertical ram-type press handles ½- to 2-in. OD steel tubing with max wall thickness of 0.083 in. and provides clearance to bend 2-in. tube 180° with 5-in. centerline radius.

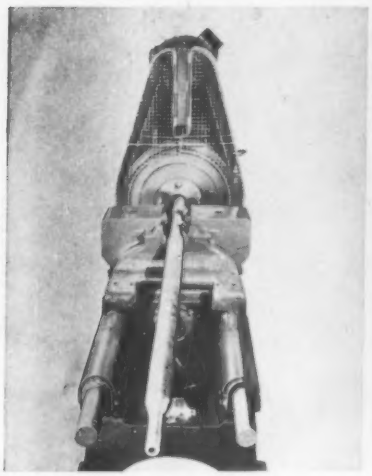


COIL-BENDING MACHINE — *Pines Engineering Co, Inc, 601 Walnut St, Aurora, Ill.* Semi-automatic. Handles tubing up to 1 in. OD, 16 gage, and 5-ft length. Operating lever initiates entire clamping and bending cycle. Bending speed is 29 rpm. Price: $3500.

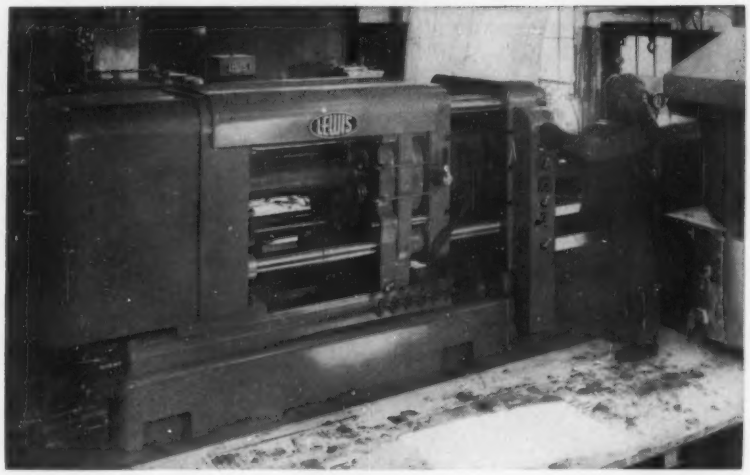


PIPE BENDING MACHINE—*American Pipe Bending Machine Co, Poultney, Vt.* Bends ⅛- to 2-in. pipe to min radius five times pipe size and max radius of 13 in. Standard 2-hp motor and drum-type reversing controller. Model 2PBR.

SPRING COILER — *Carlson Co, 277 Broadway, New York 7, NY.* Hand-operated; for making prototypes and small production runs of less than 1000. Compression springs can be coiled to any desired pitch with both ends squared automatically. Extension springs can be wound with or without initial tension. Torsion springs can be wound either left- or right-hand. Wire diameters can vary from 0.004 to 0.065 in.

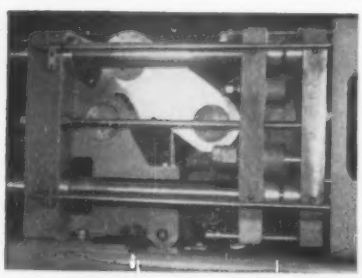


COLD POINTING MACHINE—*Abbey Etna Co, Sales Organization of Etna Machine Co, 3430 Maplewood Ave, Toledo, Ohio.* Four sizes handle tubes and bars up to 6 in. in dia. Four dies are mounted in fixed spindlehead of Nitralloy steel. Manual feed by one operator is satisfactory for steel tubes to 2-in. dia, non-ferrous to 2½ in., and aluminum to 3 in.



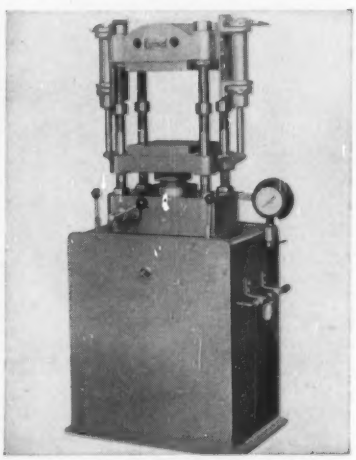
SHELL-MOLDING MACHINE—*Shalco Engineering Corp, 81 Encina Ave, Palo Alto, Calif.* Produces two parts per min with tolerance as close as 0.005 in. Choice of gas or electric curing oven. Automatic timers for both inversion and curing cycles. Dump box design is said to facilitate even sand fall.

DIE-FORGE-CASTING MACHINE—*Lewis Welding and Engineering Corp, Bedford, Ohio.* For aluminum and magnesium; uses cold chamber method of injection, but employs pair of cylinders to provide rapid fill and high final squeezing pressure. Total pressure of 100,000 lb is developed with 2100 psi in hydraulic system; final clamping pressure is 650 tons. Injection speed is 810 fpm; stroke is 12 in.; die height from 15 to 25 in. Price: $28,000. Model DC-650-B.



INJECTION-MOLDING MACHINE—*Lewis Welding & Engineering Corp, Bedford, Ohio.* Plastic enters straight-bore injection cylinder by gravity and is packed into heating section by multiple injection strokes. Electric controls allow adjustment of injection pressures from zero to 20,000 psi. Clamping system uses toggle linkage serving as locking device. Plasticizing capacity of 60 lb polystyrene per hr.

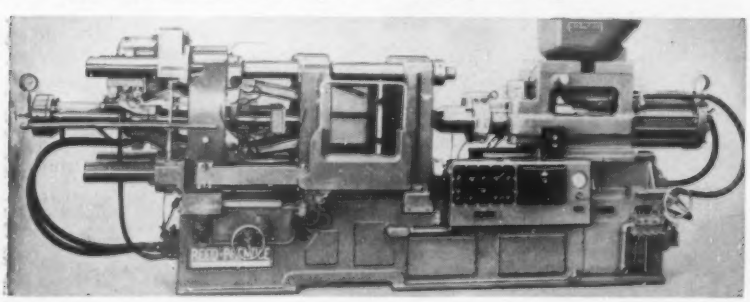
DIE-CASTING MACHINE—*A B C Die Casting Machine Co, 3394 1 W 112th Place, Chicago 28, Ill.* Air-operated, capable of free cycling speed over 1000 shots per hr. Capacity, 1½ lb; die blocks, 10x10x2½ in.; 4 tie bars; semi-automatic cycling with adjustable dwell on opening and closing of toggle.



PLASTIC MOLDING PRESS—*Elmes Engineering Div, American Steel Foundries, 1150 Tennessee Ave, Cincinnati 29, Ohio.* 30-ton capacity; equipped with air-operated push-back cylinder for powered ram return. Operates directly from shop airline. Hydrolair.

ZINC DIE CASTER—*ABC Die Casting Machine Co, 339 W 112th Pl, Chicago 28, Ill.* 1½-lb capacity; air-operated; free-cycling speed over 1000 shots per hr. Pot capacity is 275 lb of zinc, operating air pressure from 100 to 125 psi.

TOGGLE PRESS—*F J Stokes Machine Co, 5500 Tabor Rd, Philadelphia 20, Pa.* For molding delicate insert parts. Platen area is 24x24 in. Mold closes only as fast as material plasticizes. Closing action is automatically controlled through three stages.

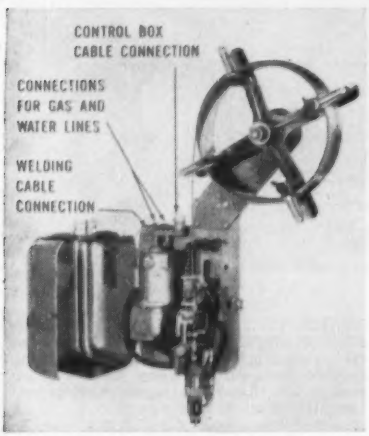


PLASTIC INJECTION-MOLDING—*Reed-Prentice Corp, Worcester 4, Mass.* 20- and 24-oz machines develop 450 tons positive mold-locking pressure and provide 16-in. stroke. Rated casting area is 200 sq in. Die stroke is adjustable through mechanism in toggle cylinder. Heated cylinder plasticizes up to 125 lb per hr. Type 450T-20 and -24.

1954 AMERICAN PRODUCTION REVIEW OF MACHINE TOOLS

WELDING AND HEAT-TREATING

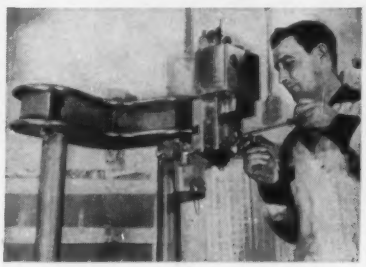
summarized from descriptions published during 1953



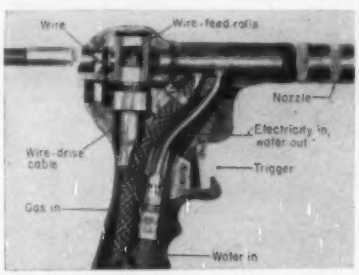
WELDING MACHINE — *Linde Air Products Company, Union Carbide, 30 E 42nd St, New York, NY.* Sigma (shielded inert-gas metal arc) welder uses electronic controls to change welding wire feed rate as required by changing arc conditions. Model SWM-3.

TORCH—*Linde Air Products Co, 30 E 42nd St, New York, NY.* Continuous, heavy-duty, inert-gas arc-welding torch operates at 500 amp with improved water-cooling method. Uses 3- or 7-in. electrodes. Model HW-12.

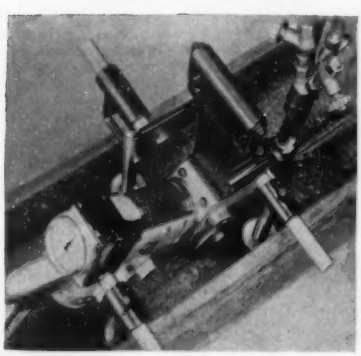
WATER-HEATER TANKS—*Reed Engineering Co, 1003-17 W Fairview Ave, Carthage, Mo.* Combination assembly press and girth seam-welding fixture handles tanks to 7 ft long, 2 ft in dia, and weighing 2 tons.

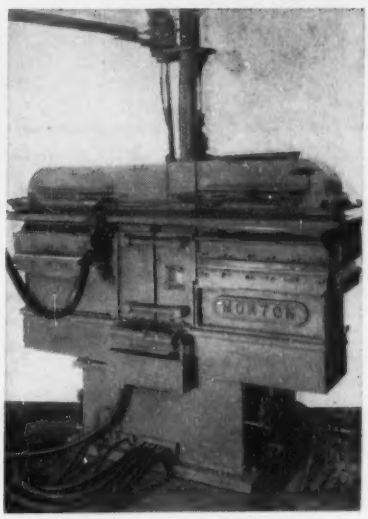


FLAME CUTTING—*Milwaukee Shipbuilding Corp, 5718 W Lancaster Ave, Milwaukee 8, Wis.* For scarfing edges of curved metal pieces in preparation for welded assembly of larger units. In addition to horizontal and vertical operation, unit works around curves. The rises and tilts of a system of twin rails match those of the metal under process. Cutting flame slants at constant angle from desired apex of scarfed edge.

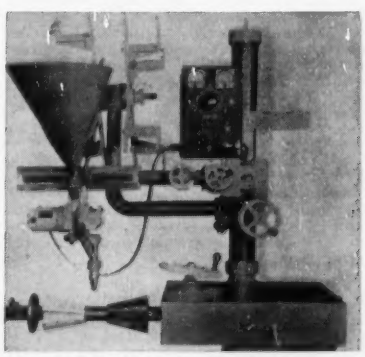


WELDING EQUIPMENT — *General Electric Co, Schenectady 5, NY.* Consumable-electrode gas-shielded welding apparatus reportedly enables doubling output on applications where filler metal must be added. Aluminum may be welded in thicknesses from 1/32 to 3 in.; stainless steel from 1/16 to 1 in. Components include: special self-regulating motor-generator-type welder; pistol-like holder; electronic wire-drive unit. Wire-feed rate can be adjusted from 0 to 750 ipm.





CAPACITOR CANS—*Morton Manufacturing Co, Broadway & Hoyt, Muskegon Heights, Mich.* Welding machine uses twin-station setup and has complete automatic control of welding cycle. Special fluid and electric rotary valves allow continuous rotation of welding torch.



AUTOMATIC REBUILDER — *Mir-O-Col Alloy Co, 312 North Ave, 21, Los Angeles 31, Calif.* For wheels, pulleys, track rollers, idlers, and cones; handles work to 40 in. in dia. Spindle speeds from ¼ to 3 rpm; welding power is 500 amp. Can be equipped with twin head to handle two different diameter jobs simultaneously. Mir-O-Col K2.

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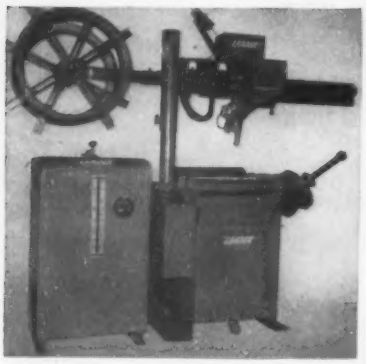
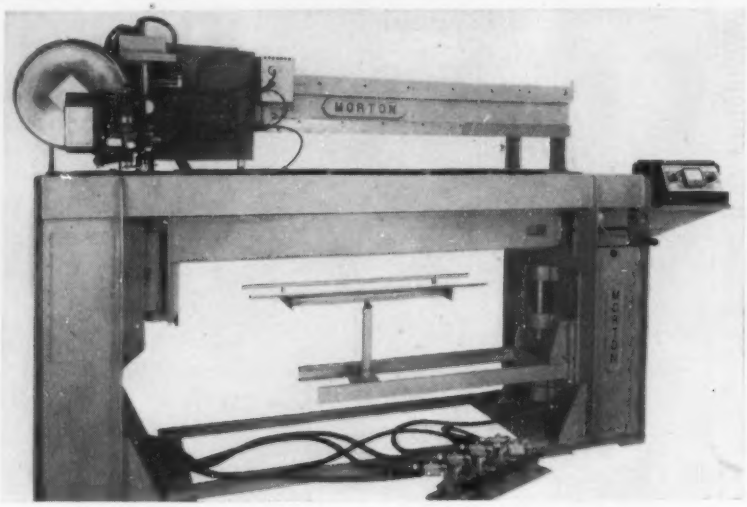
FLAME-CUTTING MACHINE — *American Pullmax Co, Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Makes accurate longitudinal cuts through webs of I-beams and wide-flange beams from 5½ to 11¾ in. Cutter is guided by three lateral adjustable rollers. Units are adaptable for use with acetylene, propane, or hydrogen gases. Model HP.

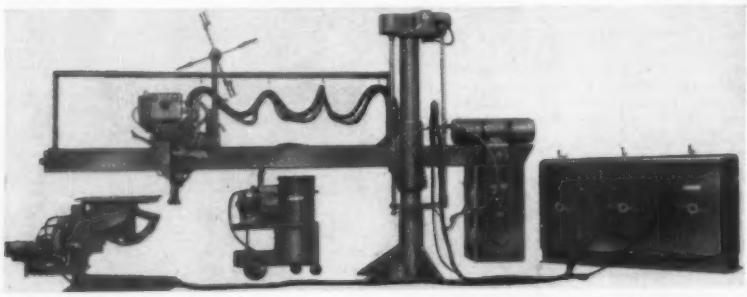


WELDING MACHINE—*Leader Welding & Mfg Co, 2418 Sixth St, Berkeley 2, Calif.* Redesign incorporates: self-adjusting arc starter permitting use of low-density current; reversible variable-speed-drive control; horizontal-arm lift; and sight-feed flux hopper. Model 550.



STAKE WELDING MACHINE—*Morton Manufacturing Co, Muskegon Heights, Mich.* Provides flat clamping said to have no tendency toward seam separation. Interlocking air valves protect machine. Model A.

PORTABLE WELDER—*Royal Equipment Corp, Burbank, Calif.* Uses 110/220 v ac; range is from 15 to 200 amp. Unit brazes, solders, cuts, or preheats, using metallic or carbon-arc process.



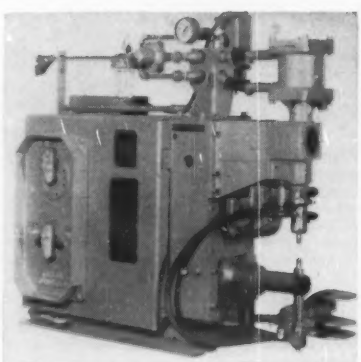
AUTOMATIC WELDING MACHINE —*Leader Welding and Mfg Co, 2418 Sixth St, Berkeley 2, Calif.* Heavy-duty head has 1200-amp dc-current source and can be used individually as three 400-amp welders. Pedestal is motorized and has 96-in. travel. The 132-in. cross-arm has variable-speed reversible-drive motor.

PROJECTION WELDER — *Sciaky Bros, 4915 67th St, Chicago 38, Ill.* Three-phase units rated 50, 75, or 100 kva and with throat depths of 12, 18, and 24 in. Can be supplied as combination projection and spot welder. Model EPT 2 and ESPT 2.

PORTABLE SPOT WELDER—*Ross Machine Tool Co, 7631 S Ashland Ave, Chicago 20, Ill.* Handles metals to combine thickness of 3/16 in. Switch setting establishes any timing cycle from 1/60 to 1 sec. 7-in. throat depth; 3-in. opening. Price: $180.

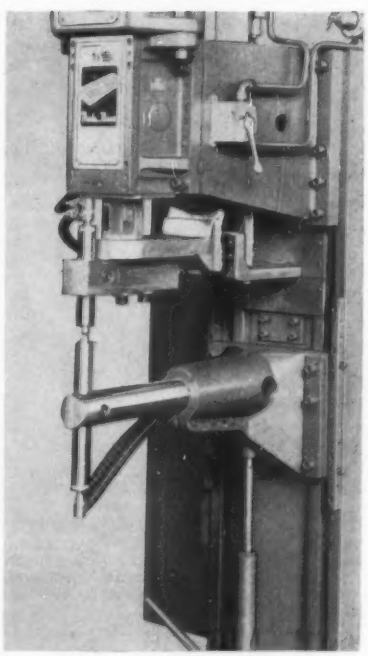
ARC WELDERS — *The Hobart Brothers Co, Troy, Ohio.* 200-amp units are gasoline-engine driven. One model is a dc unit powered by a two-cylinder engine. Other model is combination ac welder and 5-kw ac power unit driven by four-cylinder engine.

AUTOMATIC WELDING MACHINE —*The National Supply Co, Torrance, Calif.* Developed to improve quality of welds on large structural parts. Head is adjustable vertically and laterally on carriage. Two 600-amp welding generators supply current.

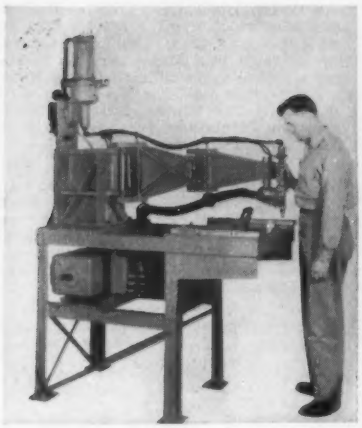


SPOT WELDER—*The Taylor-Winfield Corp, Warren, Ohio.* Air-operated; throat depth is 8 in. Welding force of either 750 or 1000 lb is obtained with 80-psi line pressure. Electrode stroke is 1¾ in. max. Magnetic or electronic contactor as well as Sequence-Weld timer is necessary. Type EB-3.

TWO-ELECTRODE WELDING — *The Lincoln Electric Co, Cleveland 17, Ohio.* Method allows higher currents which increase rate of metal deposition, amount of penetration, and welding speed. Recommended for butt or fillet welds in plates ¼ in. thick or heavier. Electrodes are fed simultaneously through single head and jaw.



SPOT WELDER—*Sciaky Bros, 4915 W 67th St, Chicago 38, Ill.* Rated at 50, 75, or 100 kva and with throat depths from 18 to 60 in. Welds two thicknesses of clean mild steel in min gage of 0.020 in. Model SPT 2.



SPOT WELDER—*The Taylor-Winfield Corp, Warren, Ohio.* Air-oil booster-operated. Designed to handle variety of jobs without expensive tooling.

CONTINUOUS TUBE MILL—*Cone-Drive Gear Div, Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Electric weld tube mill produces variety of sizes and types of tubing. Unit forms flat stock, welds the joint, burrs the seam, and sizes the tube in one continuous operation. Uses Cone-Drive double-enveloping gearing which permits carrying higher loads on smaller center distances.

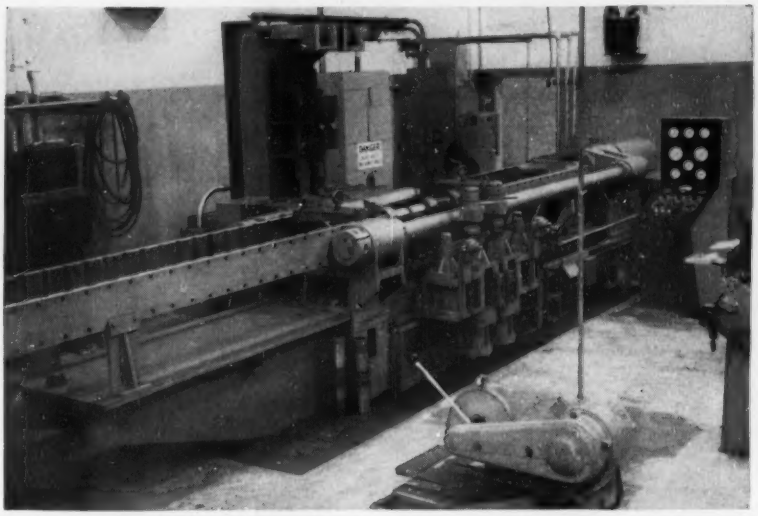
ROTATING BAND WELDER—*Morley Machinery Corp, 1239 University Ave, Rochester 7, NY.* Uses standard head and continuously consumable electrode. Rotating bands can be applied by either spiral or index feed. Machine can be used to increase dia of cylindrical parts. Model F.

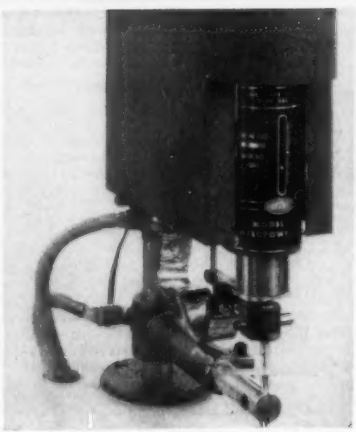
RESISTANCE WELDING MACHINE—*Multi-Hydromatic Welding & Mfg Co, 23171 Grossbeck Highway, East Detroit, Mich.* Welds retainers to valve gasket covers; production rate is over 600 per hr. Continuous chain conveyor carries 12 fixtures moved intermittently by air cylinder.

TRAILER BODY—*Morton Manufacturing Co, Broadway & Hoyt, Muskegon Heights, Mich.* Automatic four-head submerged-arc-welding machine welds complete trailer body. Heads are electrically interlocked; flux delivery and recovery is automatic.

BLADE WELDER—*Brennen Mfg Co, 676 59th St, Brooklyn 20, NY.* Fully automatic; butt-welds bandsaw blades from 1/16 to ¾ in. Copper welding jaws, built-in grinder, and double gage. Portable.

SPOT-WELDING GUN—*Air Reduction Sales Co, 60 E 42nd St, New York 17, NY.* Welds sheet metal of up to ⅛-in. thickness. Consists of hand gun, control panel, and hose and cable assemblies. Standard dc-power source is required. Water-cooled gun uses a 3/32-in. non-consumable thoriated tungsten electrode and helium or argon for a shield. Rating is 250 amp.





WELDING HEAD—*Raytheon Manufacturing Co, Waltham 54, Mass.* Designed for use with model 225A control unit. Equipped with pressure and follow-up controls, as well as visual pressure scale. Lower electrode may be used on horizontal or vertical plane. Model ILS.

FLASHWELDER — *Douglas Aircraft Co, Long Beach, Calif.* For electrical contact welding of Globemaster steel landing gear parts and struts. 32 ft long machine handles work up to 12 ft in length. Steel, titanium, or other metal bars with joining areas up to 12 sq in. are said to be welded almost instantaneously. Max current is 110,000 amp. Made by Taylor-Winfield.

WELDER—*Miller Electric Manufacturing Co, Appleton, Wis.* Moving-coil, transformer type. Rated output is 250 amp at 30 arc volts and top output is 350 amp. Two open-circuit voltages, on different ranges, give machine wide range of applications.

WELDER—*National Cylinder Gas Co, 840 N Michigan Ave, Chicago 11, Ill.* AC shop welders have range of 25 to 295 amp or 20 to 180 amp. Four-coil transformer now has coils vertically positioned for better ventilation.

RECTIFIER WELDER—*Miller Electric Manufacturing Co, Appleton, Wis.* Four models have ranges from 3 to 300, 3 to 400, 5 to 525, and 125 to 750 amp. Incorporates magnetic amplifier, current stabilizing coils, and remote control units. Selenium rectifier series.

RECTIFIER WELDER — *National Cylinder Gas Co, 840 N Michigan Ave, Chicago 11, Ill.* Ratings are 100, 200, 300, 400, and 600 amp. Three-phase transformer supplies power to full-wave selenium oxide rectifier. Rheostat controls output through saturable core.

WELDING TRANSFORMER — *General Electric Co, Schenectady, NY.* 400-amp single-phase ac unit with 60% duty cycle; current range of 40 to 500 amp. Incorporates arc-stabilizing capacitors. Type WK40K.

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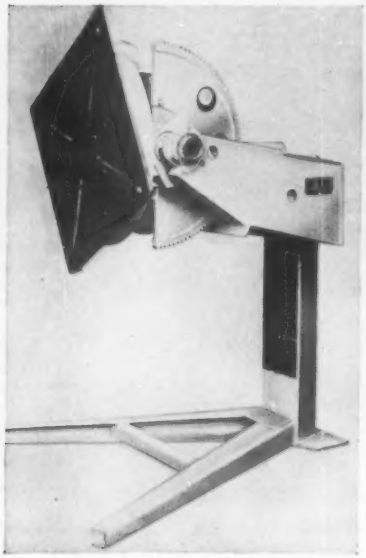
WELDING TRANSFORMER — *General Electric Co, Schenectady 5, NY.* Accommodates electrodes from 3/32- to ¼-in. dia; provides stepless current selection from 40 to 375 amp.

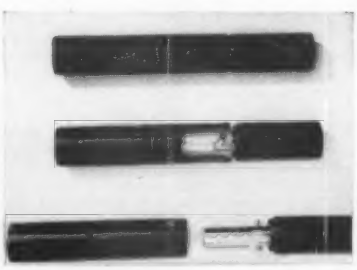


POSITIONERS — *Worthington Corp, Harrison, NJ.* For automatic or manual welding; capacities of 2500, 3000, and 6000 lb. Drive provides stepless speed change from zero to predetermined max. Uses calibrated handwheel or electric remote control. Table tilting speed is 135° in 40 sec; height is adjustable in 6-in. steps.

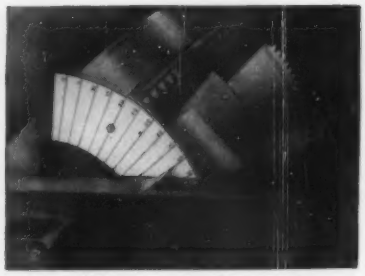
ELECTRODE HOLDER—*The Lincoln Electric Co, Cleveland 17, Ohio.* Insulated to remain cool enough to use with bare hands when using full 400-amp current. Jaws handle electrodes from ⅛ to 5/16 and have wide opening to permit fast release of stubs.

ELECTRODE HOLDER — *Welding Products Div, A O Smith Corp, Box 584, Milwaukee, Wis.* Jaw lever is placed close to handle; compound cam and lever action controls parallel opening of jaws; capacities are 200, 300, and 500 amp.

ELECTRODE HOLDER—*Erico Products, Inc, Cleveland 3, Ohio.* 300- and 400-amp units designed for cool operation, high conductivity, and light weight. Type B.



CABLE CONNECTOR—*Dalweld Co, 1 Bertel Ave, Mt Vernon, NY.* To eliminate accidental disconnection; capacities are 400 and 600 amp for both soldered and mechanical connections.



POSITIONER PROTRACTOR—*Aronson Machine Co, Arcade, NY.* Quadrant marked off in degrees from 0 to 135 in 5-deg steps. Attaches to tilt trunnion on control side. Model PRO.

WELDING POSITIONER — *Aronson Machine Co, Arcade, NY.* Provides fingertip positioning of work weighing from 10 lb to one ton. Model C2000.

WELDING POSITIONER — *Turn-A-Weld Products, Portland, Ore.* Designed to give greater speed to both automatic and manual welding from 2 in. up. Unit is adjustable to 40 speeds, features revolving table adjustable to 60° from center.

MAGNETIC CLAMPS—*Aronson Machine Co, Arcade, NY.* Locate and hold two pieces of metal together for tacking or welding. Three models are available.

WELDING HEAD — *Mir-O-Col Alloy Co, 312 North Ave 21, Los Angeles 31, Calif.* Automatically controls head and positioner as well as pilot circuit. Electro-mechanical control stops head and positioner if arc is broken or electrode sticks to work. Max current capacity is 2000 amp.

ALLOY-COATED ELECTRODE — *Stoody Co, Whittier, Calif.* Recommended as underbase for drive sprockets, tool joint shoulders, and clutch jaws. Produces alloy steel deposit of constant hardness of 29-31Rc.

ELECTRODE — *Air Reduction Sales Co, 60 E 42nd St, New York, NY.* For welding mild steel; designed for deep penetration without undercutting, with minimum spatter, and for uniform weld deposits.

COATED ELECTRODE — *Lincoln Electric Co, Cleveland 17, Ohio.* Shielded-arc electrode for operation in flat position with ac or dc. Coating is said to result in more efficient use of heat. Welding speeds in lap and fillet work are on the order of 12 to 15 ipm. Sizes are 5/32, 3/16, and ¼ in. Jetweld.

CABLE CONNECTOR — *Cam-Lock Div, Empire Products, Inc, PO Box 98, Cincinnati 36, Ohio.* Uses one cam exerting pressure parallel to axis and another exerting pressure perpendicular to axis. Contact appoaches 600 psi needed for minimum resistance. Unit is made of brass machined to smooth sliding fit.

CABLE CONNECTOR—*Bernard Welding Equipment Co, 1022 Ave N, Chicago 17, Ill.* Provides for attaching welding cable to holder with or without soldering. A ½-in. dia fine-thread socket screw is used.

GAS WELDING CONTROL—*Mullenbach Electrical Mfg Co, 2300 E 27th St, Los Angeles 58, Calif.* Limits flow duration of both gas and water to necessary welding and cooling periods. Safety light gives positive indication during flow. Electronic timer permits variation of cooling period from 5 to 30 sec.

ELECTRODE—*Eutectic Welding Alloys Corp, 172nd St & Northern Blvd, Flushing, NY.* Used as source of instant heat for pre-heating base metal or heating after welding. Steel-core electrode is inserted in ordinary holder of dc arc welder. ThermoTrode.

WELDING ELECTRODE — *General Electric Co, Schenectady, NY.* General purpose; dc reverse-polarity rod. Type W-610-A.

ELECTRODE — *General Electric Co, Schenectady, NY.* For build-up work and hard surfacing where deposited metal can be machined or flame-hardened. Sizes ⅛ to ¼ in.

ELECTRODE—*Eutectic Welding Alloys Corp, 172nd St and Northern Blvd, Flushing, NY.* For joining light sections of low- and medium-alloy steel and stainless 301, 302, 302B, and 303. Sizes are 3/32, 5/32, and 3/16 in. Type 69AC and 690DC.

CUTTING ELECTRODE — *All-State Welding Alloys Co, Inc, White Plains, NY.* For cutting, chamfering, beveling, piercing, and gouging. Used on steel, iron, copper, and nickel. With ac or dc. Sizes from 3/32 to ¼ in.

CUTTING ELECTRODE — *Eutectic Welding Alloys Corp, ChemoTec Div, 40-40 172 St, Flushing, NY.* Requires no ground lead to the work; cuts through firebrick, transite, granite, and concrete. No air or gas lines are necessary. Dyna-Trode.

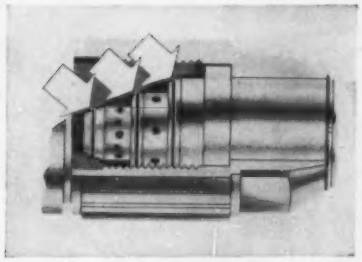
ANTI-SPATTER COMPOUND — *Thompson & Co, 1085 Allegheny Ave, Oakmont, Pa.* Can be brushed or sprayed over edges to be welded and over area 6 to 8 in. from weld. Wipes off without grinding or power brushes.

PASTE-FLUX—*Eutectic Welding Alloys Corp, 172nd St & Northern Blvd, Flushing, NY.* Brushes on to cover surface to be bonded with thin film. Joins all common metals except magnesium and aluminum. TinWeld.

ALUMINUM WELDING ROD — *All-State Welding Alloys Co, 249-55 Ferris Ave, White Plains, NY.* For assembling, repairing, and reclaiming sand castings of No. 355 aluminum. Plastic range is 1025 to 1150 F. Rods have dia from 1/16 to ¼ in. and are 36 in. long.

ALUMINUM JOINING FLUX—*Eutectic Welding Alloys Corp, 172nd St & Northern Blvd, Flushing 58, NY.* Nonhygroscopic flux is said to lower surface tension and provide improved wettability. Reportedly solves corrosion problems of normal aluminum joining. Flux 190NC.

ALUMINUM WELDING FLUX—*Solar Aircraft Co, 2200 Pacific Highway, San Diego 12, Calif.* Sufficiently active and fluid to carry off opaque slag blanket automatically. Oxyacetylene flame can be used without fear of overheating.



TORCH MIXER — *National Cylinder Gas Company, 840 N Michigan Ave, Chicago 11, Ill.* Servene seeding rings permit mixer to be attached to torch handle without using wrench. For frequent changes from welding to cutting using same handle.

ROOT PROTECTIVE—*Eutectic Welding Alloys Corp, Northern Blvd and 172nd St, Flushing, NY.* Specially designed gas flux prevents oxidation when welding stainless steel. Flux-I.

PUTTY—*General Electric Co, Fitchburg, Mass.* Fluid paste for use as weld-backing compound. Said to be particularly useful for processing low-carbon steels.

RUBBER HOSE—*Hewitt-Robins, Inc, Stamford, Conn.* Tube for acetylene and one for oxygen are vulcanized together and coverd with neoprene rubber for flame resistance. Working pressure is 200 psi.

SPRING-RECOIL RULE—*Atlas Welding Accessories Co, 707 E Lewiston St, Ferndale, Mich.* Welder's rule in 10-ft length held extended by automatic brake. Price: $3.25.

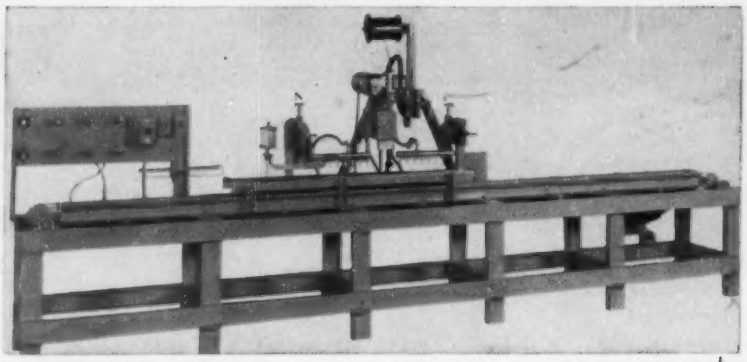
FLUX SCALING HAMMERS — *Thor Power Tool Co, Aurora, Ill.* Air-operated; said to be especially convenient for corner welds and one-hand operation. Exhaust air is blown from four holes in front of barrel to remove loose chips.

SOAPSTONE HOLDER—*Line Co, Inc, 618 Amarillo Bldg, Amarillo, Texas.* Designed to eliminate loss from breakage; locking device allows adjustment of soapstone. Price: $1.49.

WELDING BENCHES — *Industrial Equipment Bench & Mfg Co, 98 South St, New Britain, Conn.* Top is 36½ sq in. Firebricks can be installed on top of unit. Bench needs neither end or wall support.

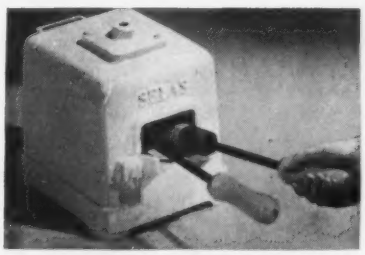
FLUX TEST KIT—*Division Lead Co, 7742 W 61st Pl, Summit, Ill.* Includes 24 test quantities of soldering fluxes, thinners, residue removers, and chemical wire strippers. Chart gives ratings for 20 metals and alloys. Price: $5.00.

ALUMINUM PRE-WELDED PROCESS — *Northwest Chemical Co, 9310 Roselawn, Detroit, Mich.* Removes soils and oxides from aluminum surfaces in preparation for welding. Alkalume.

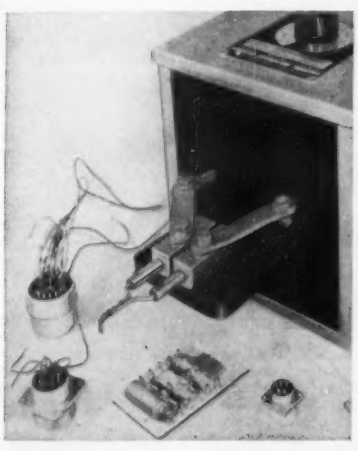


SOLDERING IRONS—*Wall Manufacturing Co, Grove City, Pa.* For production line use; said to heat four times faster than ordinary irons.

SOLDERING ELEMENT — *Hexacon Electric Co, 135 W Clay Ave, Roselle Park, NJ.* Terminal block can be removed by depressing steel-spring terminal guard.

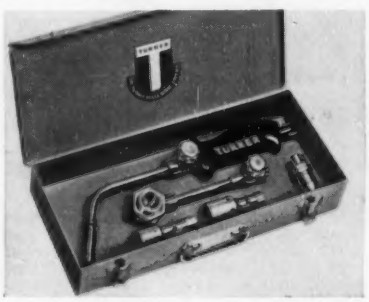


SOLDERING FURNACE—*Selas Corp of America, Erie Ave & D St, Philadelphia 34, Pa.* Gas-fired; uses radiant heat source. Can heat two four-lb irons to 900 F in 8 min with input of 9100 BTU per hr. Soldering copper is said to be surrounded by fully burned gases which prevent oxidation.



AN CONNECTOR SOLDERER—*Joyal Products, Inc, 56 Belmont Ave, Newark 3, NJ.* Machine solders from 2 to 30 terminals on AN connectors. Electrodes reach into small areas where regular iron cannot penetrate. Model 250-W.

SOLDERING CONVEYOR—*Metallizing Co of America, 3520 W Carroll Ave, Chicago, Ill.* Adjustable soldering horn with movable rails. Master control panel adjusts flow of air to gun and burners and controls speeds. Seam locator is mounted to solder gun.



FIRE POTS — *The Turner Brass Works, Sycamore, Ill.* Cast aluminum base, steel supporting posts, cast-iron burner with wide flame range, brass assembly parts. Also torch with three interchangeable all-brass burners. ICC-approved.

SOLDERING IRON — *Hexacon Electric Co, 135 W Clay Ave, Roselle Park, NJ.* Separate tip and element; 25 w with ⅛-in. tip or 30 w with 3/16-in. tip. Weight is 2 oz; price, $5.

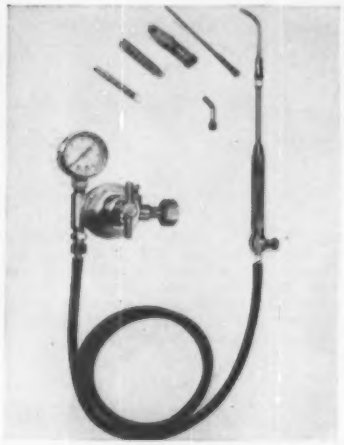
ROSIN-CORE SOLDER — *Federated Metals Division, American Smelting and Refining Co, NY, NY.* Said to have 30% greater spread than conventional rosin-core solder and to pierce retarding agents rapidly. RTS 200.

STAINLESS STEEL SOLDER—*All-State Welding Alloys Co, Inc, White Plains, NY.* Applicable with soldering iron at 430 F; said to bring high strength to soft solder class.

SOLDERING FLUX—*Special Chemicals Corp, 30 Irving Place, New York, NY.* For high-temperature brazing and hard soldering of ferrous and non-ferrous metals. Kwikflux No. 94.

FLUX — *Lake Chemical Co, 2052 W Carroll Ave, Chicago, Ill.* Designed to eliminate surface cleaning before soldering. Product is non-acid.

FLUX COMPOUND — *Essex Wire Corp, 3435 Chouteau Ave, St Louis, Mo.* For non-corrosive soldering of aluminum alloys and the joining of aluminum to other metals. May be used in powdered or molten form. Aluma-Flux S-X.



ACETYLENE OUTFIT—*Torit Manufacturing Co, 280 Walnut St, St Paul, Minn.* For light heating, brazing, or soldering. Develops temp of 2800 F. Outfit includes four tips, adapter unit, and soldering copper.

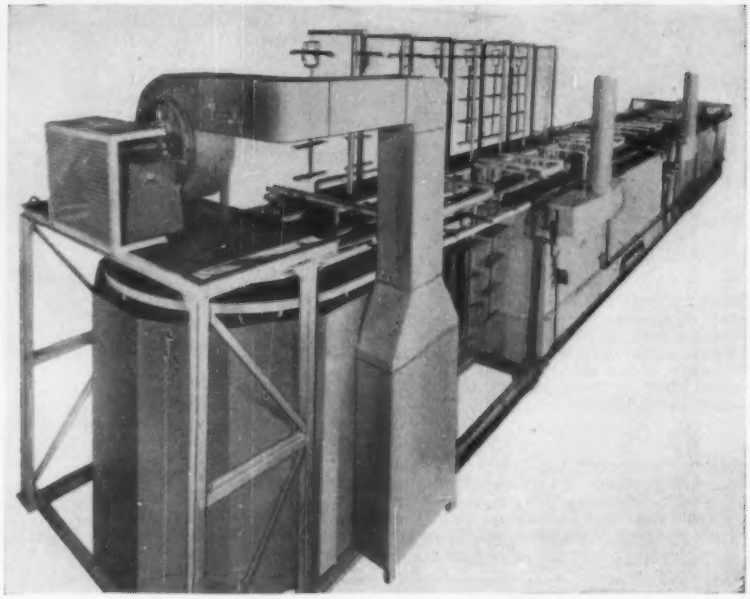
FLUX COMPOUND — *The American Platinum Works, Newark 5 NJ.* For use with silver solders in brazing of ferrous and non-ferrous. Prevents surface oxidation, cleans, and reduces surface tension. Compound 1200.

CHROME PLATING—*Ward Leonard Electric Co, Mt Vernon, NY.* Said to have deposit-hardness characteristics comparable to any conventional chrome plate above file-hard range. Can be applied to most metals in deposit thickness of 0.015 in. or more; rate of deposit is 0.002 in. per hr. Chromasol No. 2.

PLATING EQUIPMENT — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* Completely immerses the plating barrel in electrolyte. Hexagon barrel has 14-in. ID; 30- and 36-in. lengths with 125- and 150-lb capacities.

SILVER PLATING—*Specialty Manufacturers & Distributors, 508 New York St, Aurora, Ill.* Solution permits plating without electricity; applied by brush or immersion. NuSilver No. 66.

TINNING FLUX—*Farrelloy Co, 1217 N 26th St, Philadelphia 21, Pa.* Cleans and tins cast iron, stainless steel, monel, cast steel, copper, brass, and galvanized and lead-coated steel. Applied with steel wool, damp cloth, or brush. Hy-Tin.



NICKEL-PLATING — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* Process reportedly produces better and brighter finish, is cheaper to operate, and easier to control. Equipment suitable for Watts nickel bath is required. Baths may be operated from room temperature up to 140 F. Current densities may be varied from 5 to 70 asf. Nickel-Lume.

INSULATING JOINTS—*Barco Manufacturing Co, Dept J-I, 500 Hough St, Barrington, Ill.* For electrolytic tank piping; designed to provide insulating barrier without interfering with capacity for carrying liquids or gases. Available for pipe sizes from ¼ to 6 in., for temperatures to 425 F, and for pressures to 300 psi, steam, and 2000 psi, hydraulic.

STRIPPING COMPOUND — *Enthone Inc, 442 Elm St, New Haven, Conn.* For electrolytic stripping of defective copper, nickel, and chromium plates from zinc-base die castings. Operated from room temperature to 180 F with defective castings as the anode at 6 v.

FLUX PASTE—*Farrelloy Co, 1217 N 26th St, Philadelphia, Pa.* Said to tin copper pipe and oil-impregnated bearings without precleaning; joins all dissimilar metals except aluminum. Fas-Tin.

ELECTROPLATING SUPPLIES — *General Electric Co, Schenectady 5, NY.* Line of metallic rectifier power supplies for electroplating and anodizing operations uses interchangable components. DC ratings range from 500 amp at 6 v to 2000 amp at 48 v; laboratory ratings are 50 amp at 9 v and 65 amp at 18 v.

COPPER PLATING — *Smoothex, Inc, Cleveland, Ohio.* Said to save nickel, eliminate buffing, and have exceptional speed of deposition. Can be used with present plating equipment. Reportedly increases production up to 60%.

AUTOMATIC PLATING MACHINE—*Wagner Brothers Equipment Co, Inc, Detroit, Ill.* Uses transfer and conveying principle based on two motions—longitudinal and vertical. Working parts are mounted on carriage which moves on single track between two rows of tanks and is actuated by hydraulic cylinder. Shaft running length of carriage is fitted with gears meshed to racks on work-lifting arms. Hydraulic and electric controls are provided.

PLATING SYSTEM—*Wagner Brothers, Inc, 402 Midland, Detroit, Mich.* Designed to replace or augment still-tank plating. Spacing to any dimension in 2-in. increments is accomplished by moving pusher shoes. Unit can be loaded at any point.

PLATING PROCESS—*Poor & Co, Promat Div, 851 S Market St, Waukegan, Ill.* For use on parts commonly having copper-nickel-chrome finish. Claimed to give 200-hr protection of steel against red rust. Probrite CR-723.

PLATING EQUIPMENT — *Sel-Rex Precious Metals, Inc, 229 Main St, Belleville 9, NJ.* Portable; for mass-production or pilot-plant plating of precious metals using Bright Gold process and Bright Silver Sol-U-Salt bath. Includes selenium rectifier, movable rack which can accommodate portable plating barrel, and ½-hp motorized pump. Agitation is accomplished with "jet" at bottom of tank.

NICKEL PLATING PROCESS — *General American Transportation Corp, 135 S LaSalle St, Chicago 90, Ill.* By simple immersion in chemical solution without use of electric current. Can be applied to any metal (except lead, tin, cadmium, and zinc), with any thickness, at rate of about 0.001 to 0.002 in. per hour. Corrosion resistance is reportedly two or three times better than with electrolytically deposited plate. Thickness can be contolled within 0.0001 in. Kanigen process.

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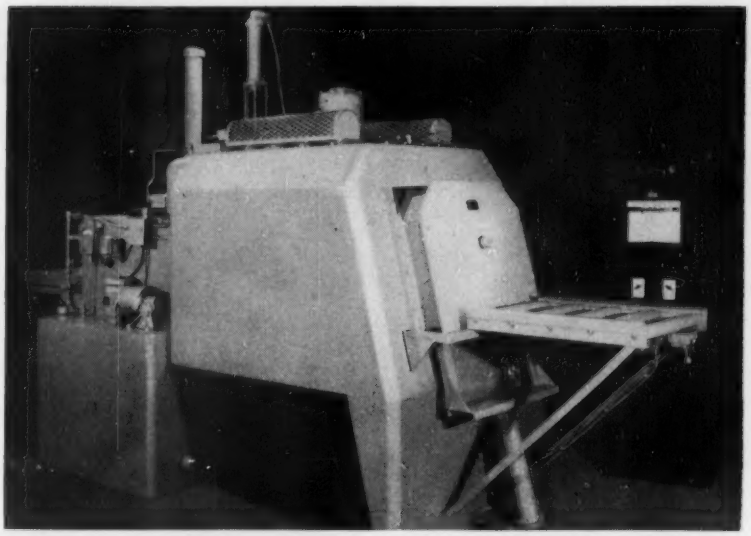
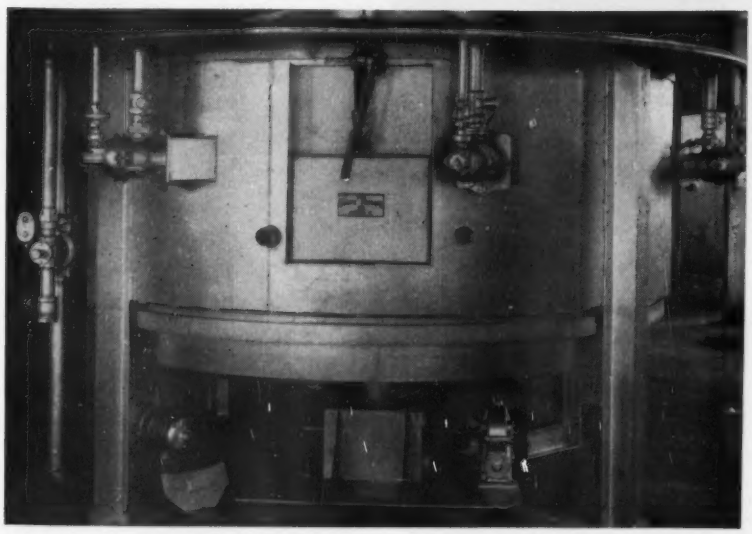
HEAT-TREATING FURNACE—*Ipsen Industries, Inc, 715 S Main St, Rockford, Ill.* Full forced-convection heating; operates at 1850 F. Cold-chain transfer method moves work tray from heating to quench zone. Work requiring atmosphere cooling is kept on quench-cool rack above quench tank. Hearth dimensions are 24x36x12 in.; treats 300 lb per hr. T-3000.

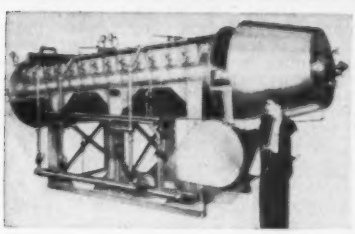


TEMPERING FURNACE—*Waltz Furnace Co, 1901 Symmes St, Dept 1, Cincinnati, Ohio.* Flattens and tempers large thin circular pieces. Unit is gas-fired, recirculating. Temp range is from 350 to 1000 F.

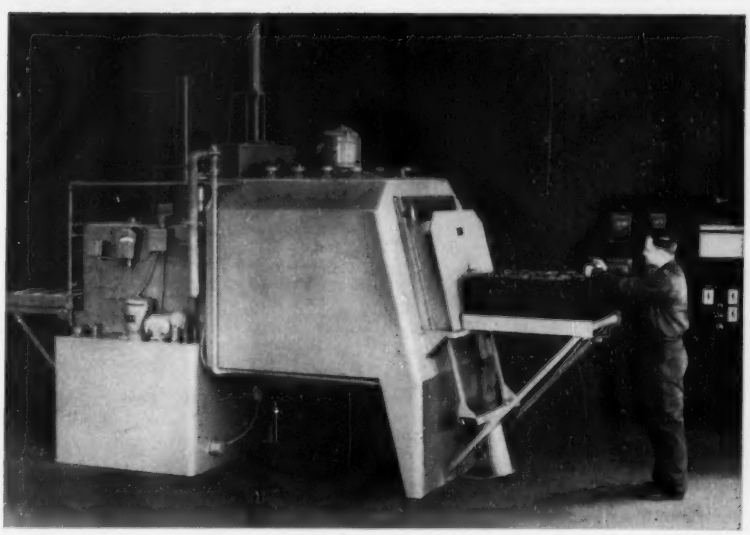
ROTARY HEARTH FURNACE — *Waltz Furnace Co, Dept A, 1901 Symmes St, Cincinnati ,Ohio.* Continuous operation in forging and heat treating. Range: 1200 to 2300 F. OD 7½ ft; column 30 in.; chamber height 15 in.



HEAT-TREATING FURNACE—*Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Pa.* Obtains temperatures to 3100 F; designed to use either hydrogen or dissociated ammonia. Protective atmosphere consumption is 200 cu ft per hr.



HEAT-TREATING FURNACE — *American Gas Furnace Co, 1006 Lafayette St, Elizabeth, NJ.* Rotary retort; three separate zones of temperature control. Work space is 15 in. in dia by 10 ft long. Production of non-ferrous metal parts is 1000 lb per hr. Model 139DR.



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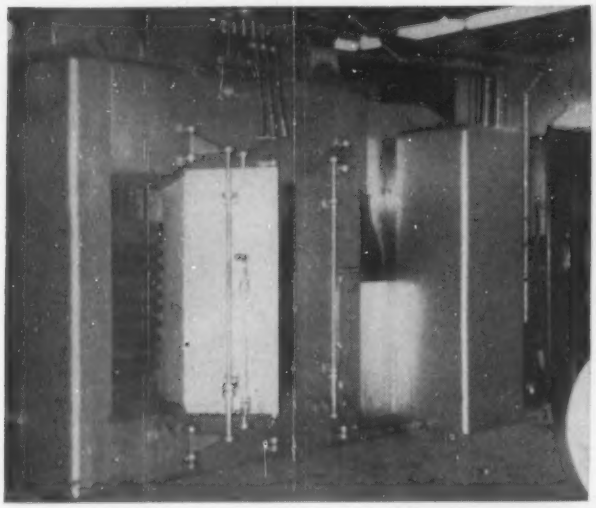
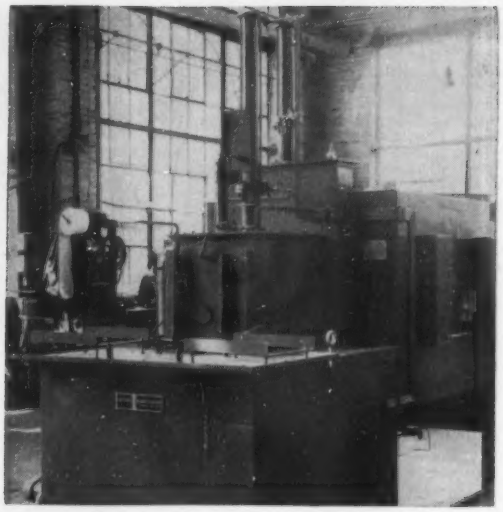
HEAT-TREATING UNIT — *Ipsen Industries Inc, 715 So Main St, Rockford, Ill.* Automatically transfers heated load onto quench-cool rack which holds load for atmosphere cooling or lowers it for oil quench. Operates to 1850 F. Handles 400 lbs per hour. T-400.



TEMPERING FURNACE — *Waltz Furnace Co, 1901 Symmes St, Dept 1, Cincinnati, Ohio.* Self-contained unit with three sections of pressure plates and three doors. Valves for opening and closing dies are above center door. When cylinders are raised, dies open to provide 10 openings for insertion of flat pieces.

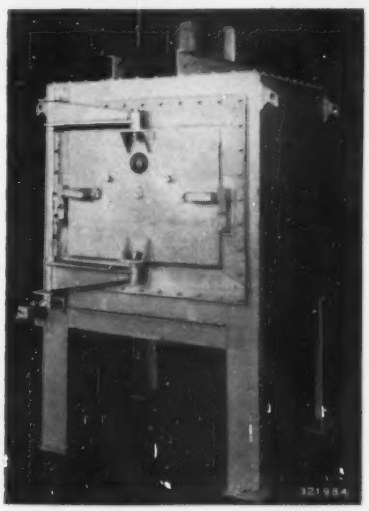
DRAW FURNACE—*Blue M Electric Co 306 W 69th St, Chicago 21, Ill.* Two standard models have dimensions of 12x12 by 24 in. deep and 15x18 by 24 in. deep. Door automatically self-locks at any position; rear-wall impeller guides airflow; power input is automatically regulated in relation to temperatures. Range is from 300 to 1350 F.

FURNACE — *Pereny Equipment Co, Columbus, Ohio.* Carbon-resistor type; for ultra-high-temperature work in the fabrication of ceramic materials. Reaches 5000 F in two hours. Elements are water-cooled and protected with electrical interlocks.



FORCED-CONVECTION FURNACE *Leeds & Northrup Co, 4908 Stenton Ave, Philadelphia 44, Pa.* Automatic control of both temperature and atmosphere throughout heating and quenching cycles. Range is from 1500 to 1750 F.

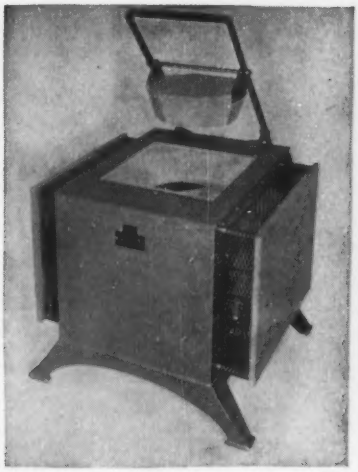
ELECTRIC FURNACE — *Armor-Tuf Sales Corp, 299 Madison Ave, New York, NY.* Designed to harden tools and steel parts with Armor-Tuf steel-hardening compound but also applicable to heat-treating, enameling, chemical drying and wax burnout operations. Furnace temperature is 1800 F. Price: $195.



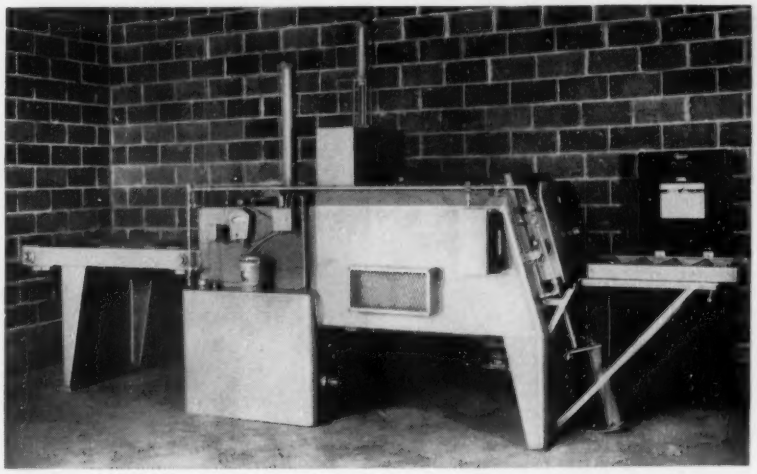
BOX DRAW FURNACE — *Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* For applications requiring no protective atmosphere; for batch drawing or tempering high-volume work that can be handled on trays. Operating temp is 1400 F.

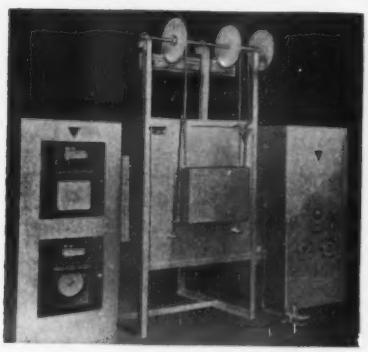
PIT FURNACE—*Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* Gas-fired; cycle anneals small handtools and can be used for carburizing, hardening, and nitriding. Removable retort makes continuous operation possible. Max operating temperature is 1600 F. Five sizes have charge space ranging from 14-in. dia by 18 in. deep to 30-in. dia by 72 in. deep.

← RECIRCULATING DRAW FURNACE —*Cooley Electric Mfg Corp, 38 South Shelby St, Indianapolis 7, Ind.* For tempering of steel and other operations requiring precise temperature control with emphasis on uniform heat-treating. Chamber sizes are 8x6x14 and 12x8x18 in. Baffle walls prevent direct radiation from elements to work surface.

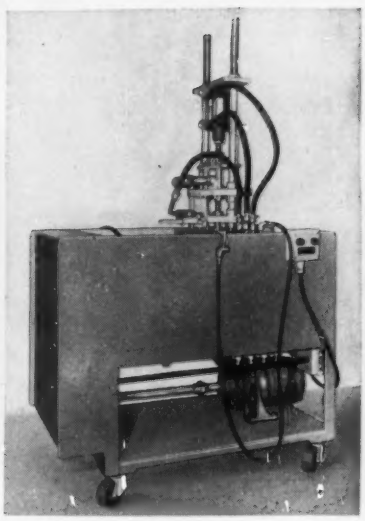


ELECTRIC FURNACE — *The Sentry Co, Foxboro, Mass.* For melting small crucible charges of metals and alloys; operates at 2500 F. Includes automatic pyrometer control equipment.



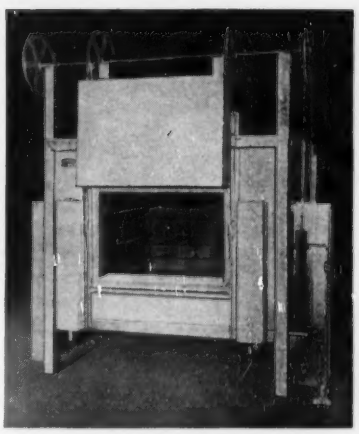


FURNACE — *Pereny Equipment Co, Columbus, Ohio.* Continuous duty at 2500 F; loading area is 14x12x24 in. deep. Gas-tight ports are provided for connecting atmosphere - reducing sources. Globar units with air-cooled terminals are located beneath hearth and above chamber. Model FG-430.

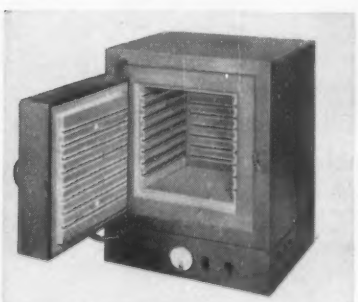


QUENCHING MACHINE — *Palmer Manufacturing Co, Cleveland, Ohio.* Provides automatic, controllable cycle to case harden die holes. Adjustable to handle holes with 1/16- to 3-in. ID in blanks ¼- to 8-in. OD from 1/16 to 6 in. long.

DRAW-QUENCH FURNACE — *Ipsen Industries, Inc, 715 S Main St, Rockford, Ill.* For scale-free tempering and controlled-oxidation tempering from 400 to 1400 F. Controlled endothermic atmosphere is provided in both heating and cooling chambers. Hearth is 24x36x 12. Model D-Q 300.



ELECTRIC FURNACE — *Pereny Equipment Co, 893 Chambers Rd, Columbus 12, Ohio.* Operates at 2400 F with load of 350 lb of metal per hr. Chamber size is 36 in. wide by 48 in. deep by 24 in. high. Heated by Globar elements running front-to-back. Model TF-24.



ELECTRIC FURNACES—*L & L Manufacturing Co, 804 Mulberry St, Upland, Chester, Pa.* Heat ranges are from 2050 to 2300 F; front-loading and top-loading models. Automatic controls are available.

STEEL POTS—*Eclipse Fuel Engineering Co, Rockford, Ill.* For heat-treating furnaces; three types of coatings for temp to 1500 F, temp between 1500 and 1700, and temp over 1700 F.

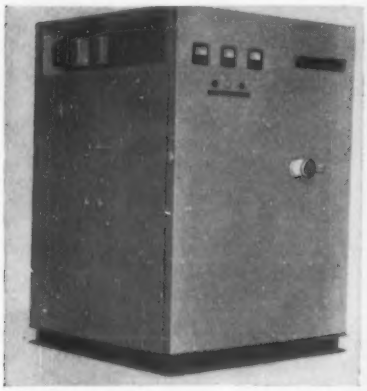
DEW POINT—*Ipsen Industries, 715 S Main St, Rockford, Ill.* Automatic regulator for controlled-atmosphere metal-treating furnaces operates electronically to continuously record and control funace dew point. Continuous record is charted on graph; scale settings can be made from —60 to +90 F.

DRYING UNIT—*Corona Manufacturing Corp, 5210 San Fernando Rd, Glendale 3, Calif.* Consists of infra-red pyrex tubes requiring two connections. Lengths are 2 to 8 ft; widths, 12 to 30 in.

GAS-OIL BURNER—*Eclipse Fuel Engineering Co, Rockford, Ill.* For firing industrial furnaces in range from 200 to 2400 F. Secondary air meets gas or oil mixture in both converging and rotating pattern.

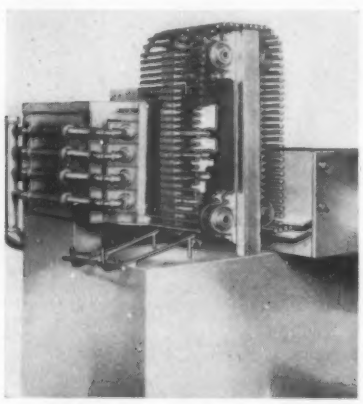
IMMERSION HEATER — *Cleveland Process Co, Cleveland, Ohio.* Steel-sheathed for use in alkaline baths. Said to protect heater and liquids from damage due to carbonization. Series W.

WELDING and HEAT-TREATING—furnaces and heaters



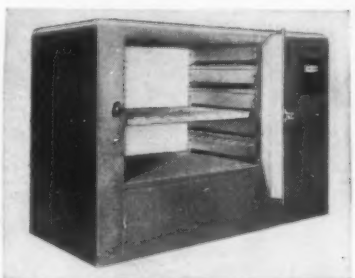
INDUCTION HEATER — *Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* Radio frequency 25-kw generator for long production runs. Standard and de-luxe models with de-luxe having electronic keying circuit for rapid and precise control. Closed-circuit water-cooling system uses distilled water.

LINE BURNER—*Eclipse Fuel Engineering Co, Rockford, Ill.* Gas-fired, retention type for oven and air-heating installations. Each section is equipped with drilled and matched flanges.



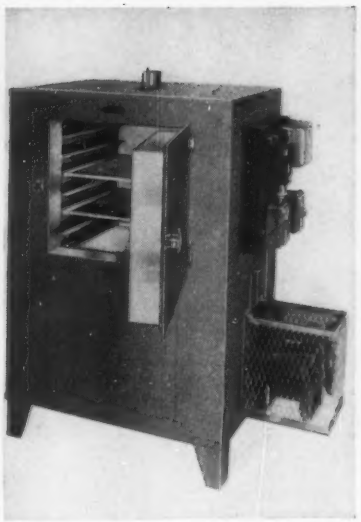
HEATING UNIT — *Gas Appliance Service, Inc, 1211 Webster St, Chicago 14, Ill.* Handles end-lengths 4 in. long of pieces from 6 to 23 in. long. Stock sizes from 1¼ to 1½ in. in dia can be handled. Incorporates conveyor and automatic hopper feed.

FURNACE BRICK — *The Carborundum Co, Niagara Falls, NY.* Made of hollow spheres of aluminum oxide, a high-heat resistant refractory. Type Alfrax B1.

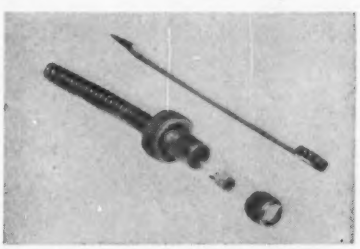


RECIRCULATING OVEN — *Perenyi-Equipment Co, 893 Chambers Road, Columbus 12, Ohio.* Chamber size of 30x24x24 in. for production runs on small items. Operates at temperatures from 0 to 550 F; outside air can be injected into circulating system. Model DRF-30.

PORTABLE OVEN — *Grieve-Hendry Co, Inc, 1815 W Lake St, Chicago 12, Ill.* Permits separation of products while drying, baking, or preheating. Primary application is for stabilization of welding electrodes. Adjustable temperature control to 325 F. Model PL 2A.



CABINET OVENS—*Grieve-Hendry Co, Chicago, Ill.* Either horizontal or vertical flow for temperatures to 650 or 850 F. Motor-driven blowers propel heated air in definite pattern.



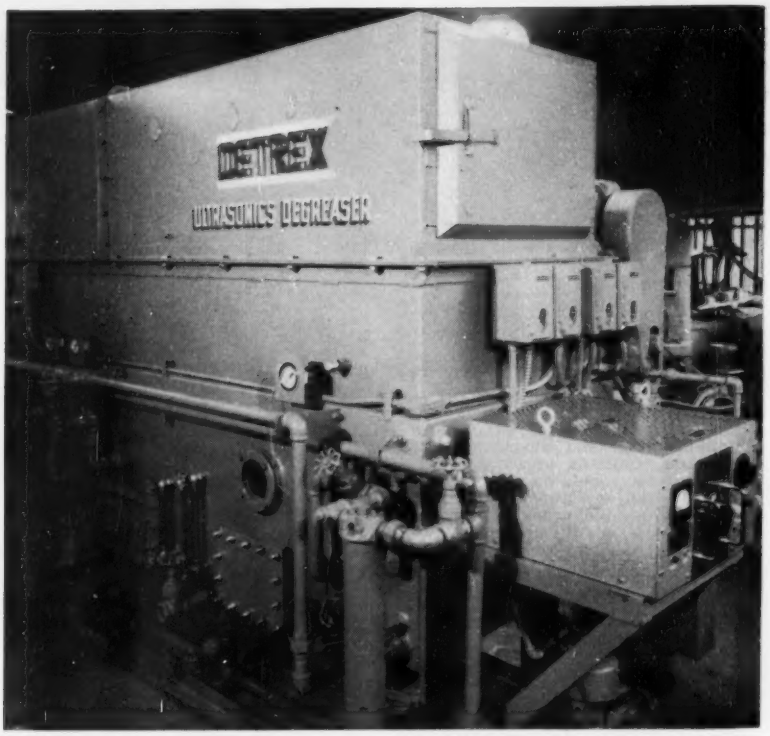
FLAME SAFEGUARD DEVICE — *Combustion Control Corp, 720 Beacon St, Boston 15, Mass.* Photo-conductor cell provides flame safeguard for manually ignited and automatic burners. Gives positive response to flame failure.

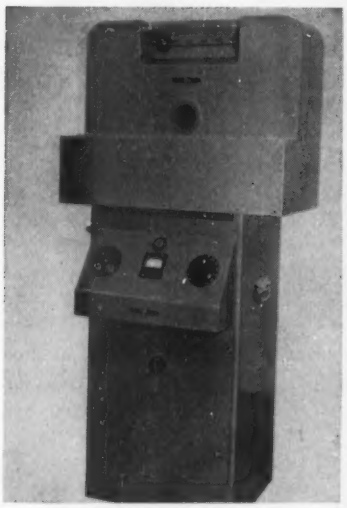
BOLT HEATER—*Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* For hollow holding bolts used on heavy steam equipment. Handles bolts from 1 to 3 ft long with hold diameters from ½ to 1 in.

1954 CLEANING AND FINISHING

summarized from descriptions published during 1953

ULTRASONIC DEGREASER—*Detrex Corp, Box 501, Detroit 32, Mich.* Electrical energy is transmitted to a ceramic transducer where it is converted into sound energy and projected through the solvent at frequency of 430,000 cps. Transducers operated at 40 v; Trichlorethylene or other solvents can be used.





ULTRASONIC DEGREASER—*Topper Equipment Co, Clark Township, Rahway, NJ.* Uses quartz crystal. Region above crystal is agitated to accelerate action. Parts are rinsed by clean fluid and dried by vapor process.

VAPOR DEGREASER — *Metalwash Machinery Corp, 901 North Ave, Elizabeth 4, NJ.* Redesign incorporates recessed condensing coils, removable pump chamber, stainless steel separator, one-end maintenance, and demand control of water into condensing system. Can be converted to vapor spray unit.

VAPOR DEGREASER—*Baron Industries, 241 W Avenue 26, Los Angeles 31, Calif.* Cleans parts automatically in non-flammable trichlorethylene vapors in less than a minute. Air-cooled condenser controls vapor height and reclaiming of dirty solvent. Working area is 23 in. in dia.

DEGREASING AGENT — *Cottentex Manufacturing Co, 405B E Wells St, Milwaukee, Wis.* Finely-ground cellulose fiber is said to have exceptionally high absorbency. Claimed to be particularly adaptable for degreasing ball, roller, and needle bearings.

VAPOR DEGREASER—*J D Wallace & Co, 132 S California Ave, Chicago 12, Ill.* Portable. Uses standard electric supply; takes 20 min to heat; uses 2½ gal. of solvent. Type DG-1.

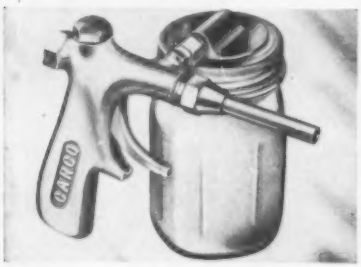
DEGREASER—*Brulin & Co, 2939 Columbia Ave, Indianapolis, Ind.* Solvent is non-toxic and nonflammable, said to be particularly adapted to cleaning electrical motors.

VAPOR DEGREASER — *Manufacturers Processing Co, 1360 Hilton Rd, Detroit 20, Mich.* Capacity is 500 lb of steel per hr; reportedly cleans and dries parts in 50 sec. Uses 220-v power. Model B-121. Price: $534.

CLEANING and FINISHING

WET-BLASTING UNIT — *American Wheelabrator & Equipment Corp, 1140 S Byrkit St, Mishawaka, Ind.* For handling small stamping dies, die-casting dies, and reconditioning valves, pistons, and rods. Dimensional tolerances of 0.0001 in. are said to be maintained because of use of 80 to 2500 mesh abrasives. Blasting compartment is 30 in. square by 31 in. high.

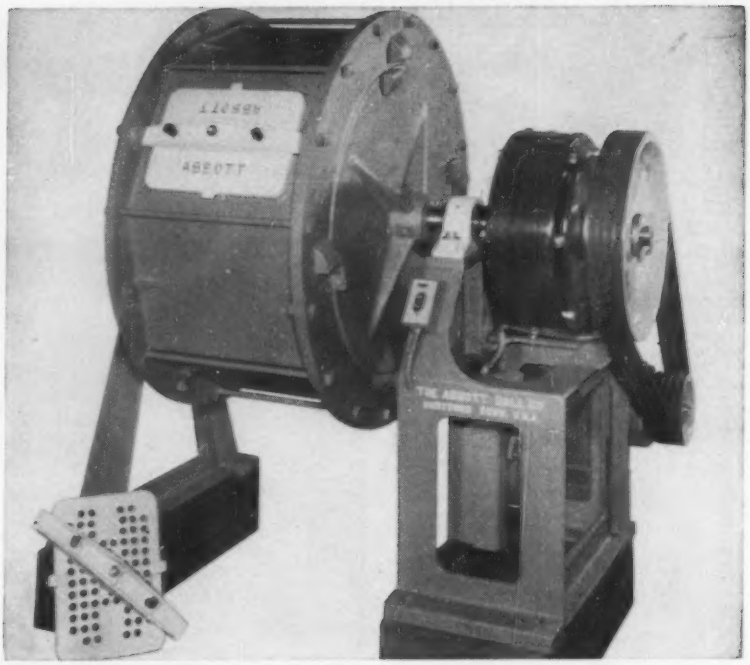
WET-BLAST CABINET — *Vacu-Blast Co, Inc, Belmont, Calif.* Cabinet is 48x36x75 in.; abrasive ranges from 50 to 2000 mesh, non-metallic, used with dispersing agent and inhibitor. Air ejector draws liquid from top surface and shoots it tangentially into mixing chamber.



BLAST GUN—*C A Roesch & Co, 1221 South Hope St, Los Angeles 15, Calif.* Triple-purpose unit for sandblasting, liquid-cleaning, and air-cleaning. Operates on minimum pressure of 75 lb but 100 to 140 should be used for sandblasting. Gun is equipped with hardened steel jet and nozzle.

BARREL TUMBLER — *White-Roth Machine Corp, Lorain, Ohio.* Removes slag, burrs, and rust; capacity is one ton. Said to burr items in 1/3 of manual time, removes slag in 1/10 time. Drive speed is from 5 to 30 rpm.

CHIPS — *Roto-Finish Co, Kalamazoo, Mich.* For fast cutting operation on ferrous and non-ferrous metal parts. Said to be extremely fine grained, and tougher than aluminum-oxide chips. Coruloy T.

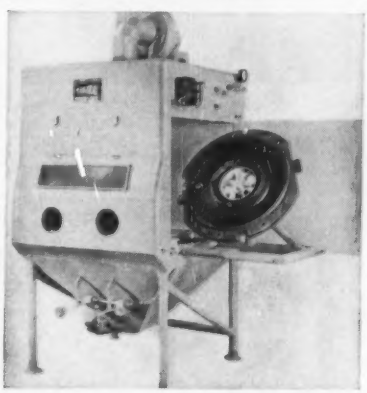


BLAST BARRELS — *Pangborn Corp, Pangborn Blvd, Hagertown, Md.* Two new models have sizes of 3 and 18 cu ft. Type GN.

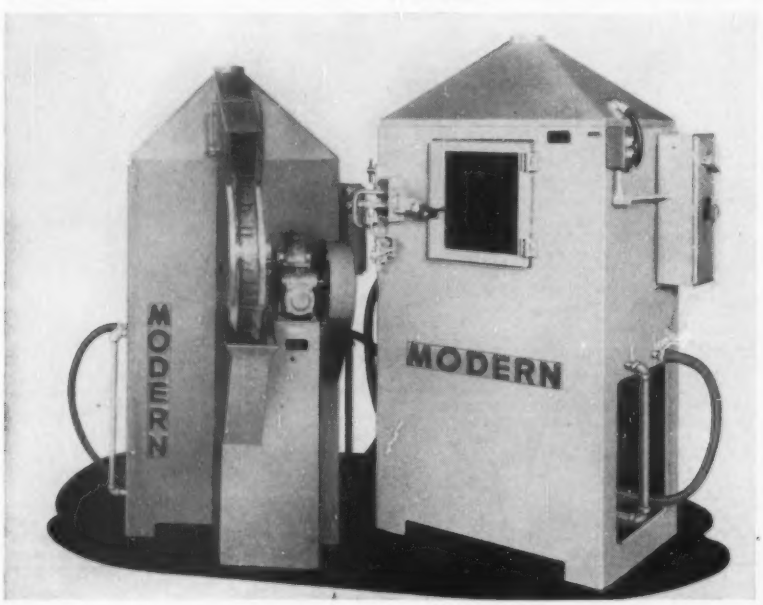
TUMBLING MEDIA—*Crown Rheostat & Supply Co, 3465 N Kimball Ave, Chicago, Ill.* White ceramic of uniform size in a triangular shape to eliminate lodgement hazard.

DESCALER—*Enthone Inc, Dept AM, 442 Elm St, New Haven, Conn.* Removes oxide and scale from steel; for tumble derusting as well as use in vats or tanks and for primary plating cycles. Controlled acidity permits uniform pickling with minimum attack on base metal. Dry powder: 100-, 400-lb containers.

BARREL FINISHING UNIT—*The Abbott Ball Co, Railroad Place, Hartford, Conn.* For burnishing, burring, and cutting-down operations. Precision speed controls; interchangeable parts; color dynamics; high, vertical barrel. Four standard sizes are available in ten basic combinations with single, double, and triple compartments.



BLASTING MACHINE—*R W Renton & Co, 868 Addison Rd, Cleveland 3, Ohio.* Liquid abrasives with screen size ranging from 60 to 5000 can be handled and reversible pump reportedly permits change of slurry in less than 5 minutes. Slurry is drawn up by siphon injection and propelled from blasting nozzle by means of high-velocity air stream. Metal removal is held to 0.0001 in.



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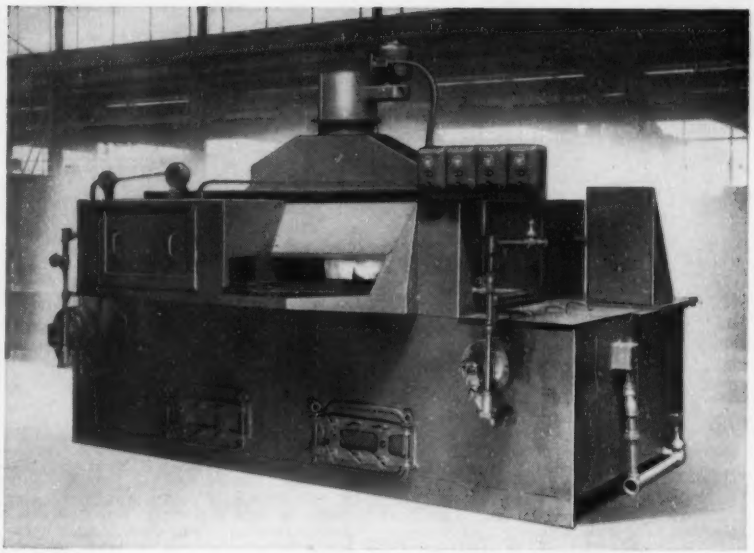
BLAST MACHINE—*Modern Industrial Engineering Co, 14230 Birwood Ave, Detroit 4, Mich.* Burrs soft-metal parts with maize blasted under factory airline pressure. Model MA-24 has ferris-wheel-type fixture. Rotating between two guns at 1/5 rpm. Wheel carries 16 to 24 parts in holding wires bent to suit the part. Larger parts are handled on MA-1, a stationary unit in which parts rotate on fixed axis.

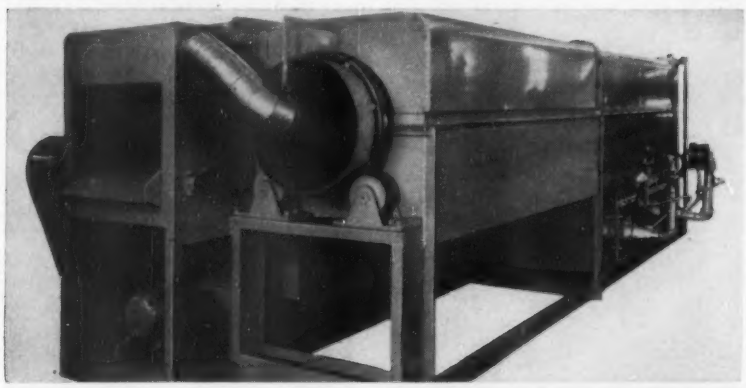
WASHING MACHINE — *The Cincinnati Cleaning & Finishing Machinery Co, Schmidt Bldg, Cincinnati 2, Ohio.* Two tunnels process different-size pieces simultaneously: standard parts on plant monorail system at 25 fpm, miscellaneous parts on wire-mesh belt at speed between 10 and 30 fpm.

CLEANER — *Klem Chemicals, Inc, 14401 Lanson, Dearborn, Mich.* Applied to ferrous metals by immersion or brush; phosphoric-acid base dissolves surface salts and rust. Rust-Sol No. 123.

WATER WASH COMPOUND — *Klem Chemicals, 14401 Lanson Ave, Dearborn, Mich.* For reclaiming paint from spray booths. May be used up to seven days before draining is required.



WASHING MACHINE—*G S Blakeslee & Co, 1822 S 52nd St, Chicago 50, Ill.* Turntable takes work through spray for washing and rinsing, through air blowoff section, and back to loading, unloading station. Temperature is maintained by thermostatic valve.



METAL CLEANER — *Van Straaten Chemical Co, 546 W Washington St, Chicago 2, Ill.* Cleans aluminum and other non-ferrous metals without discoloration or deposit. Compound is in-process spray-washer cleaner. Operating temps vary from 70 to 212 F. Vantrol 5541A.

SMALL PARTS CLEANER — *Jiffy Parts Cleaner, 8415 Fountain Ave, Los Angeles 46, Calif.* Five-jet agitator unit with 12 ports which admit compressed air to set up turbulence activating 6½-gal. tank of solvent.

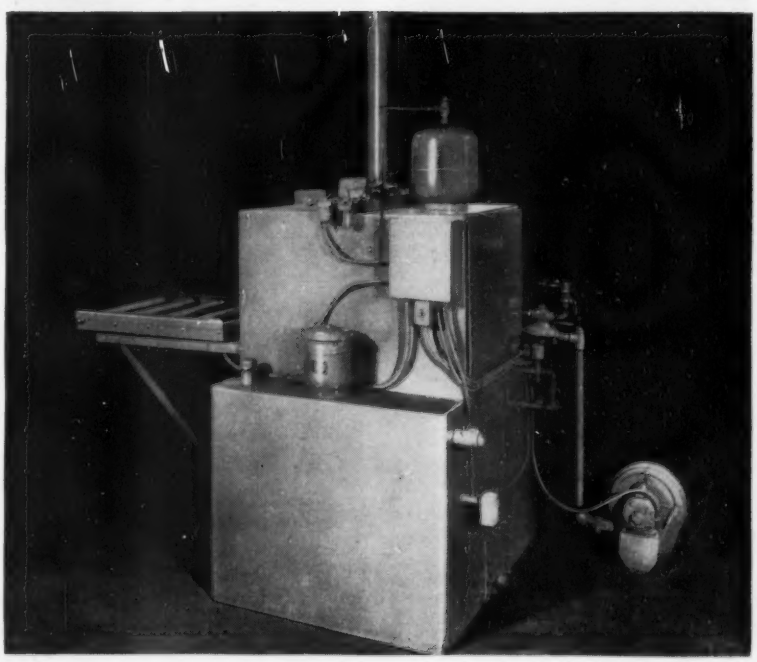
STEAMJET CLEANER — *Livingstone Engineering Co, Worcester, Mass.* Provides fingertip control of operation of steam generator, regulation of detergent flow, and atomization of steam.

WASHING MACHINE — *Metalwash Machinery Corp, 901 North Ave, Elizabeth 4, NJ.* Combination rotary drum and flat belt; removes cutting oils, grease, and dirt from metal parts. Small parts are handled in drum; larger parts on conveyor.

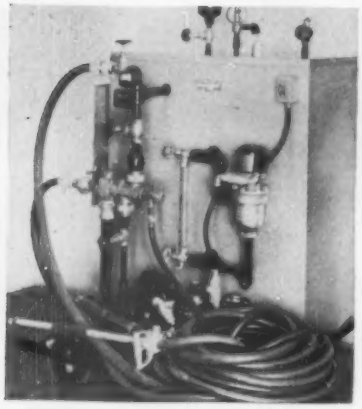
EMULSION CLEANER—*Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Philadelphia 7, Pa.* Cleans non-ferrous metals without tarnishing and protects ferrous parts from rusting. Flash point of 260 F; fire point of 300 F. EC-54.

CLEANER — *Whitfield Chemical Co, 14225 Schaefer Highway, Detroit 27, Mich.* For one-step cold cleaning and phosphating of ferrous metals, aluminum, and zinc. Solo-Phos.

STEAM NOZZLE — *American Nozzle Corp, 30 Church St, New York, NY.* Center blade creates pressure differential between two planes of steam and produces cutting action at point where planes converge.

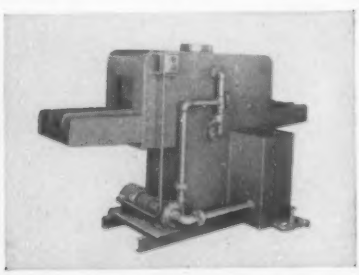


PARTS WASHER — *Ipsen Industries, Inc, 715 S Main Street, Rockford, Ill.* Capacities are 300, 400, and 700 lb. Automatic surface spray skim-off moves oil and other impurities into overflow ledge and thus eliminates secondary rinsing operations.

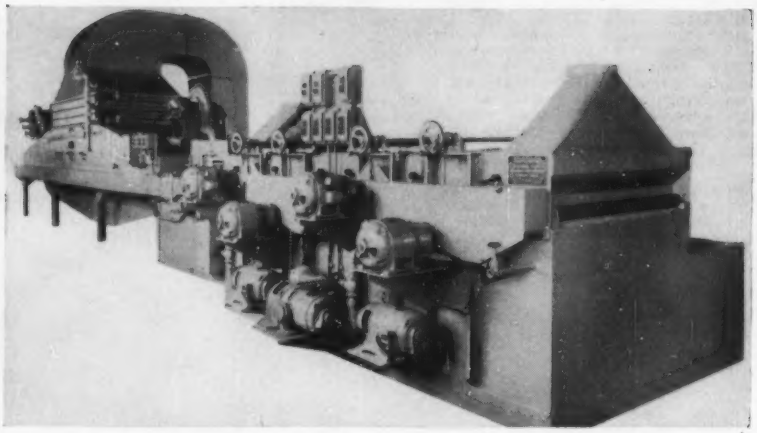


JET CLEANER — *Livingstone Engineering Co, 100 Grove St, Worcester 5, Mass.* Incorporates Speedylectric steam-jet and Sellers injector hydraulic jet. Said to be specially adapted to oil refineries, paint works, and chemical plants.

CLEANING UNIT — *Graymills Corp, 3705 N Lincoln Ave, Chicago 13, Ill.* For flushing, spraying, or soaking metal parts. Abrasive-proof pump delivers solvent through flexible metal hose. Three-level shelf supports parts. Minimum capacity is 100 gal., max 175 gal.



WASHING MACHINE—*G S Blakeslee & Co, Chicago, Ill.* For low-production jobs or cleaning between operations. Furnished for steam, gas, or electric heat.



FORCED-CIRCULATION WASHERS —*Ipsen Industries, Inc, 715 S Main St, Rockford, Ill.* Automatic cycling, washing, and rinsing in one operation. Temperatures, workhandling, cycles for solution circulation, and skim-off are controlled automatically by presetting panel. Load capacities are 300, 400, and 700 lb.

STEAM CLEANER—*Hypressure Jenny Div, Homestead Valve Mfg Co, Coraopolis, Pa.* Delivers full blast 90 sec after cold start. Vapor spray output is 90 or 120 gph. Zippered canvas cover protects unit.

STEAM CLEANING—*Clayton Manufacturing Co, Box 550, El Monte, Calif.* Discharges 150 gal. per hr; pressures range from 30 to 100 psi; attains full pressure from cold start in two min. Models include oil- or gas-fired, electrical, or gasoline-engine driven, and portable stationary, or trailer type. Model LH.

SHEET-CLEANING MACHINE—*Gilron Products Co, 6007 Euclid Ave, Cleveland 3, Ohio.* Drawcote applicating machine processes sheets and blanks at speeds up to 55 fpm. Stock is cleaned with alkaline cleaner and rotary brushes. Steam-heated solution tanks handle blanks up to 48 in. wide.

CLEANING SPRAY—*Kelite Products, Inc, Los Angeles, Calif.* Removes grease, oil, wax, dirt, dye, cutting soap, and light carbon from metals, plastics, rubber, porcelain, composition, concrete, or wood.

SAFETY SOLVENTS — *John B Moore Corp, PO Box 3, Nutley, NJ.* To replace carbon tetrachloride in specialized fields of cleaning. All products have low toxicity and high evaporation speed.

SOLVENT—*Tect Inc, Cortlandt & Erie Sts, Dumont, NJ.* Non-flammable, fast-evaporating, and low in toxicity. May be used with vapor concentrations of 10 to 20 times those permissible with carbon tetrachloride. Tecsolv No. 383.

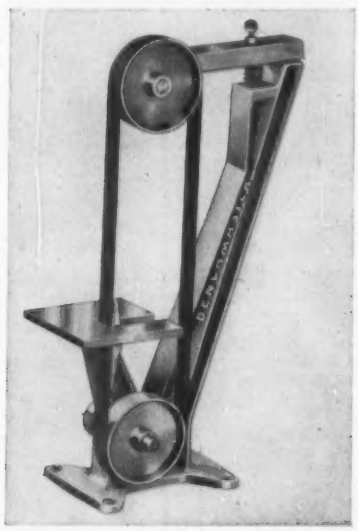
CLEANING SOLVENT — *Graymills Corp, 3707 N Lincoln Ave, Chicago 13, Ill.* Removes cutting oils, lubricants, grease, and sludge. Contains Tergene; flash point 110 F; non-toxic. Agitene.

GENERATOR-MOTOR CLEANER — *The Shaler Co, Waupun, Wis.* Motor can be submerged in solution and allowed to run for a few minutes. It is dried with compressed air.

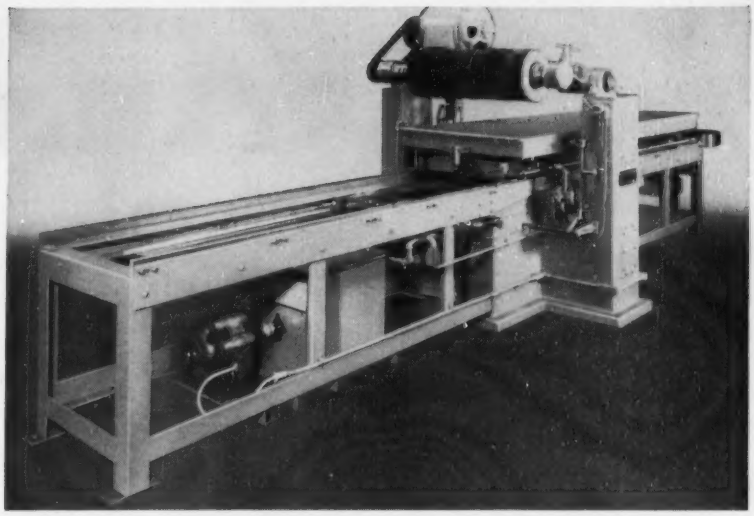
SOLVENT SPRAY GUN—*John B Moore Corp, Nutley 10, NJ.* For continuous spray cleaning by solvent, emulsion, or aqueous solution; draws fluid directly from 55-gal. drum. Equipped with die-cast handle, built to stand over 4 tons of shock. Price: $19.95.

SAFETY SOLVENTS—*Harco Chemical Co, 338 North Ave E, Cranford, NJ.* For degreasing electrical equipment and metal parts. Flashpoint ranges from 140 to 280 F.

HYDRAULIC HONING—*Hydro-Hone Manufacturing Co, Huntington Park, Calif.* For liquid-abrasive polishing of all metal parts. Special pump allows fluid to bypass all bearings; interior air is changed completely every 3 sec.

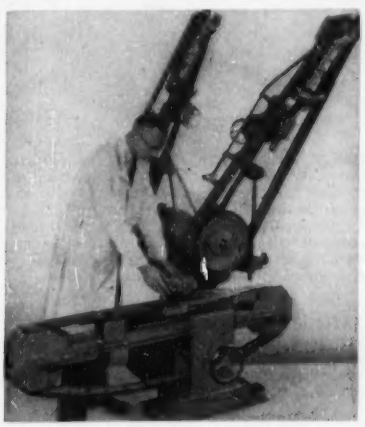


BELT SANDER—*Benchmaster Manufacturing Co, Gardena, Calif.* For any speed to 8000 sfm; 4-in.-dia belt wheels mounted on double-row, double-sealed ball bearings for long life.



POLISHING MACHINE—*Central Machine Works. Worcester, Mass.* For extrusions, sheets, rods, and smaller, odd-shaped pieces. Horizontal type, hydraulically operated, strokes from 7 to 21 ft. Table can be oscillated across face of polishing roll during stroke.

CARBIDE-TOOL FINISHING—*Hammond Machinery Builders, 1600 Douglas Ave, Kalamazoo, Mich.* Machine for final finishing with abrasive belt. Tungsten-carbide-faced platen permits finishing of end, top, and side clearance angles. Can also be used for sharpening HSS tools. Model 454.



POLISHING CONVEYOR—*Curtis Machine Corp, Jamestown, NY.* For use with grinding and polishing attachment; permits application of production-line technique to polishing equipment. German.

DIAMOND-LAPPING SUPPLIES — *Penn Scientific Products Co, 5941 Alma St, Philadelphia, Pa.* Master kit includes 4-oz. bottle of oil, atomizer oil applicator, assortment of Spectrum micro laps, orangewood sticks, and felt-mounted points.

DIAMOND COMPOUND RACK — *Engis Equipment Co, 431 South Dearborn St, Chicago 3, Ill.* Will hold four applicator guns of any size for Hyprez diamond compound.

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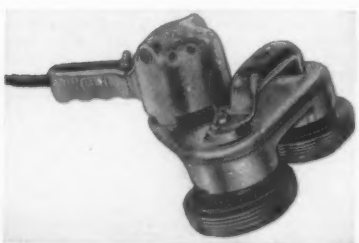
BUFFING LATHE — *Hammond Machinery Builders, Inc, Kalamazoo, Mich.* Speed range is 1500 to 3000 rpm; rating is 10 hp; speed changes are made during operation. Model 10VRO.

POLISHING DIES—*Dykrex Corp of America, 33-35 Bloomfield Ave, Newark, NJ.* Machine polishes and refinishes tungsten carbide dies; designed for instant changeover from automatic to semi-automatic or manual operation. Model M.

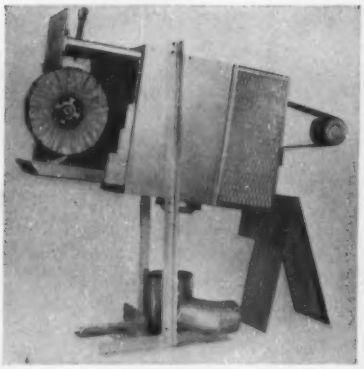
BELT GRINDER — *Curtis Machine Corp, Jamestown, NY.* Can be attached to air outlet and used as portable grinder or mounted to a machine tool. Uses dynamically balanced, rubber-covered contact wheels in variety of diameters, widths, and degrees of hardness. Model A-1 uses 1-in. belts; Model A-2, 2-in.

SANDER-POLISHER — *Syntron Co, 511 Lexington Ave, Homer City, Pa.* Electric unit with attachments and accessories for sanding, polishing, buffing, drilling, and light grinding.

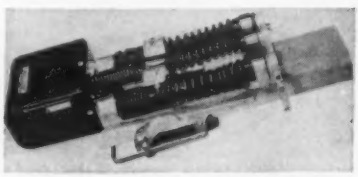


SANDER-POLISHER — *Cyclo Manufacturing Co, 2140 South Delaware St, Denver, Colo.* Translatory action for sanding, filing, feathering, and polishing metals, enamel, and other surfaces. Either electric or air-operated.

POLISHING UNITS—*Curtis Machine Corp, Jamestown, NY.* Completely integrated, pedestal-type, double-end, abrasive-belt contact units. Mounting permits back-stand extensions to swivel 90°. German.



SELF-FILTERING HOOD—*Slonneger Products Co, 1524 Milburn Ave, Dayton 4, Ohio.* Uses wind created by revolving buffing wheel or belt to withdraw dust down to 0.02 microns in size. Filters facilitate reclamation of valuable metals. Universal hood can be adjusted to any height spindle and any angle.



BUFFING-COMPOUND APPLICATOR—*George L Nankervis Co, 19255 West Davison, Detroit 23, Mich.* Air-operated; feeds any number of strokes per minute. Rate of feed is adjustable from 0.0015 to 0.015 in. per stroke. Four models accommodate round and rectangular compound bars.

BURRING TOOL — *Nobur Manufacturing Co, 717 N Victory Blvd, Burbank, Calif.* For simultaneous burring and chamfering of front and back faces of holes in sheet metal, extrusions, and castings. Can be used with portable drill motors or on stationary machine tools. Independent controls set working depth or chamfer of both front and rear cutters. Two models handle ferrous and non-ferrous metals. Price: $24.50.

SANDER-POLISHER — *Du-Fast, Inc, 32 E 4th St, New York 3, NY.* Attachment for any ¼-in. electric drill. Operates at double speed with orbital motion. Price: $15.95.

BURRING AGENT—*Agri-Indus Manufacturing Co, 1327 Huntington Bank Bldg, Columbus 15, Ohio.* Made from corn cobs which are ground, cleaned, and milled into various sizes. Can reportedly be used three times longer than sawdust as polisher and absorbent. Cocob No. 40.

POLISHING COMPOSITION — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* For use with brushes or buffing wheels. Abrasive particles in composition are consistently sized to produce uniform finish.

FINISHING METHOD—*Penn Scientific Products Co, 5941 Alma St, Philadelphia 24, Pa.* Uses dual wheel consisting of 120-grit silicon-carbide vitrified-bond grinding wheel for semi-finishing and phenolic-resin diamond-lap insert for fine lap finishing. Final result is carbide-tool surface of 1 or 2 mu-in. rms. Kit includes lapping compound, oil, atomizer, and roller.

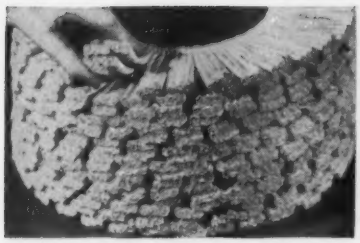
BUFF TREATMENT—*American Buff Co, 2414 S LaSalle St, Chicago 16, Ill.* Used on company line of bias sisal buffs to double buff life. Process locks fibers together to exact specifications and bias cut. Buffs are adaptable to any size spindle. Permanizing.

CENTERLESS BUFFS — *American Buff Co, 2414 S LaSalle St, Chicago, Ill.* Rigid steel ring grips cloth securely in channel. Pre-assembly is accomplished with two tubes, one fitted inside the other.

WHEELBRUSH—*Fuller Brush Co, Industrial Div, Hartford 2, Conn.* As trim wears down, sideplates can be exchanged for smaller ones to expose new length of trim. Said to be perfectly balanced by clamping almost identical number of filaments in each tuft.

SANDING CLOTH—*Bay State Abrasive Products Co, Westboro, Mass.* Open-mesh; for all metal and paint finishes. Available in sheets, disks, rolls, and belts.

CHIP BRUSH—*Biltwell Brush Co, 225 S Church St, Rockford, Ill.* For cleaning machines and applying lubricants. Horsehair bristles are resistant to acids and alkalis.



SISAL BUFF—*Geo R Churchill Co, Inc, 7501 Fayette St, N Quincy 71, Mass.* Adapted to work involving curved surfaces and recesses; diameters from 6 to 18 in. for hand buffing or automatic machines. Type 20-RD.

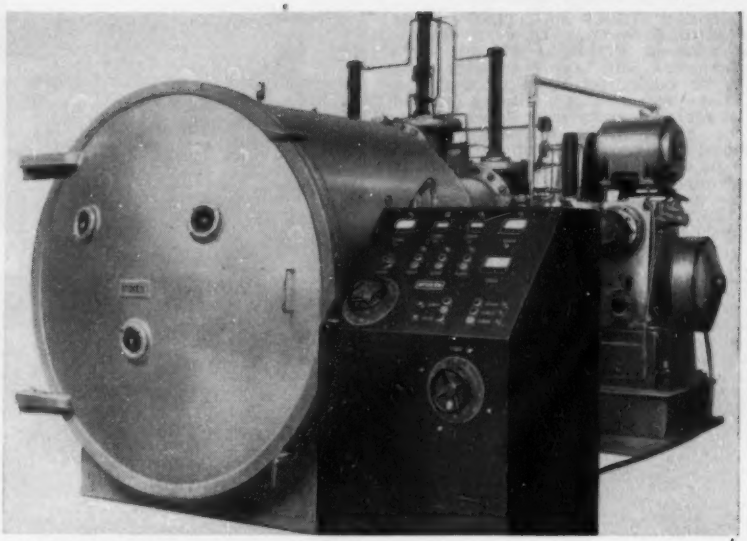
SELF-VENTILATING BUFFS—*Hanson-Van Winkle-Munning Co, Matawan, NJ.* For hand or machine operation; permits wheel to be operated at higher speed with greater pressure. Available in standard and heavy-duty weights with diameters of 12, 14, 16 and 18 in.

ABRASIVES — *Brightboy Industrial Div, Weldon Roberts Rubber Co, Sixth Ave and North 13th St, Newark 7, NJ.* For particular use in removing heavy tool marks from forged aluminum, smoothing weld marks, and polishing and burring stainless steel. Rubber binder is compounded with abrasive grain. Variety of sizes in wheels, cylinders, and blocks. Series BL.

FINISH DIE-CAST ZINC — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* Aluminum-oxide compositions for the coloring operation in finishing zinc base and aluminum die castings. May also be used for steel and stainless.

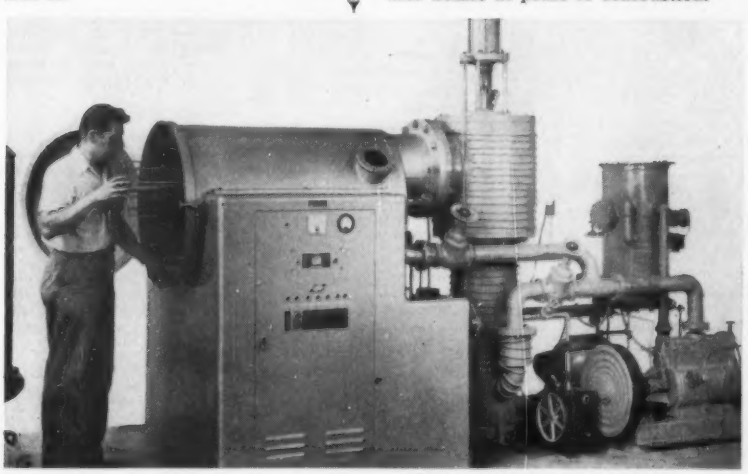
METAL-FINISHING PROCESS — *Apollo Metal Works, Dept A-2, 66th Pl & S Oak Park Ave, Chicago 38, Ill.* For stainless steel, aluminum, monel, carbon, and other metal-alloy plates, sheets, and coils. Microinch tolerance control of process.

VACUUM METALLIZER — *Consolidated Vacuum Corp, 735 Ridge Rd, W Rochester 3, NY.* Horizontal chamber has 30-in. dia; normal production rate is four cycles per hr. Entire cycle is controlled from centralized point in front of the viewing port. Model LC1-30.



SURFACING MATERIAL — *Gamble Brothers, Louisville, Ky.* Resistant to abrasives, heat, and chemicals; has mechanical properties of wood. Gam-En-Wood.

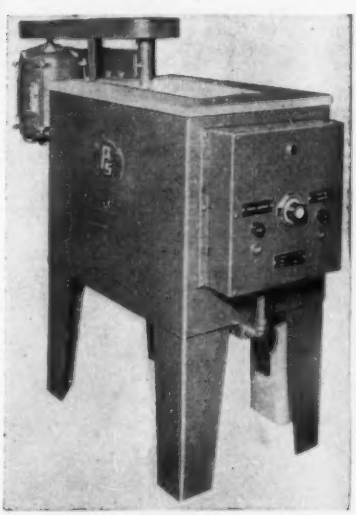
METALLIZING MACHINE—*Vandersee Engineering Co, Inc, 727 W 7th St, Los Angeles, Calif.* Compact, and lightweight. Gas mixing chamber is built into nozzle at point of combustion.



VACUUM METALLIZER—*F J Stokes Machine Co, Philadelphia, Pa.* Chamber is 72 in. in dia, 60 in. long. Rapid pumpdown is accomplished by three-stage pumping system. Evacuation to ½ micron takes place in 7 min. A high degree of automation is incorporated into the control system.

ALUMINUM FINISH — *Parker Rust Proof Co, 2177 E Milwaukee Ave, Detroit 26, Mich.* For use over Parco compound on ferrous parts which may have to stand severe atmospheric conditions. Finishes are phenolic applied by centrifuge.

STEEL COATING — *Steelcote Manufacturing Co, St. Louis, Mo.* Finish is impervious to moisture and resistant to most chemicals. Now made in colors of black, white, gray, ivory, green, red, orange, and yellow. Withstands dry heat to 300 F. Steelast.



DIPPING TANKS — *Globe Imperial Corp, 2023 Kishwaukee St, Rockford, Ill.* For Plastic Seal hot-dip protective coatings; 6 to 1225 lb per load. Positive agitation and special heating elements. Five models.

CLEANING and FINISHING

AIRLESS SPRAY PAINTING — *Bede Industrial Products, Inc, 1110 Brookpark Road, Cleveland 9, Ohio.* Hot-pressurized paint is sprayed without air jet by equipment specially designed for the operation. Advantages claimed include: low spray loss; improved finish; better paint adhesion; higher gloss; and less dirt pickup. Volume and angle of spray are controlled by nozzle selection; nozzles have fan width from 15 to 110°. Lacquers, synthetics, wrinkles, varnishes, and other types of finishes can be sprayed.

FILTRATION SYSTEM — *Industrial Filtration Co, Lebanon, Ind.* For paint-spray-booth water. Features automatic skimming and either intermittent or continuous filtration. Filter is continuous self-cleaning gravity unit. Delpark engineers will suggest the most satisfactory automatic skimming method for particular applications.

DRY LUBRICANT — *Gilron Products Co, 6007 Euclid Ave, Cleveland 3, Ohio.* Forms dry, protective, and lubricating film on formed metal parts. Applied by dip, spray, or flow; removed by hot alkali bath. Drawcote.

PROTECTIVE FINISH — *Allied Research Products, Inc, 4004 E Monument St, Baltimore 5, Md.* Chromate conversion coating for magnesium is produced by immersing parts from 15 sec to 2 min. Highly resistant to atmosphere corrosion as well as that from chemical source. Iridite No. 15.

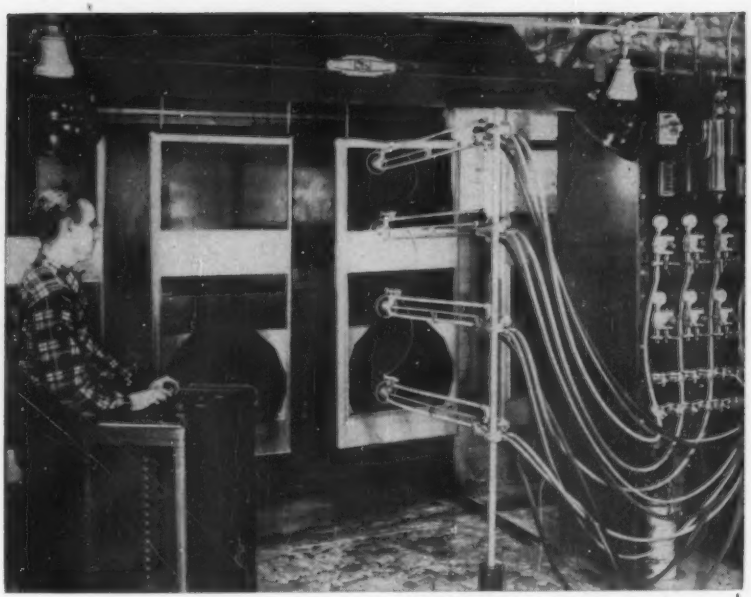
RUST-INHIBITOR—*Whitfield Chemical Co, 14225 Schaefer Highway, Detroit, Mich.* Metal-cleaning compound for use in mechanical power-washing equipment. Rinsing after cleaning is unnecessary. Powrite.

STRIPPABLE COATING — *Plastics Div, Ernst Bischoff Co, Ivoryton, Conn.* Designed to prevent corrosion or abrasion damage to metal tools and parts during storage, handling, or shipment. Thermo-Cote D.

ORGANIC FINISH — *Apollo Metal Works, 66th Place and South Oak Park Ave, Chicago, Ill.* For aluminum, brass, steel, and zinc coils in width from ⅛ to 30 in. Baked-enamel finish is said to stand up well under forming, drawing, bending, or fabricating operations.

MASKING DISKS — *By-Buk Co, 4314 W Pico Blvd, Los Angeles 19, Calif.* For spray painting; diameters from ¼ to 4 in. Removal is facilitated by overlapping. Withstands 325 F for 30 min.

SPRAY GUN STRAINER — *Clear-flo Strainer Co, 8050 35th Ave NE, Seattle, Wash.* Fine-gage brass screen slides over intake tube of paint spray gun. Four sizes.



DRY LUBRICANT—*Drilube Co, 723 W Broadway, Glendale 4, Calif.* Coating contains molybenum disulphide and is reportedly characterized by high film strength and low coefficient of pressure. Temperature range is -100 to 550 F for continuous exposure. Can be applied to metals, rubber, and certain plastics.

ANTI-CORROSION COMPOUND — *Bel-Ray Co, Green Village Road, Madison, NJ.* Highly concentrated molybdenum disulphide compound with melting point over 600 F. Prevents seizing at bearing pressures of 100,000 psi. Molylube Anti-Seize.

STEEL-SURFACE PROTECTION — *Constad Laboratories, 120 W 28th St, New York, NY.* Can be used over rusted surfaces after removing excess scale. Product is applied with brush or spray gun. Formula No. 50.

OIL ADDITIVE—*Industrial Chemicals Dept, Atlas Powder Co, Wilmington 99, Del.* Said to offer more complete protection of ferrous surfaces than possible with other non-metallic inhibitors. Atpet 100.

PROTECTIVE PAINT—*Pennsylvania Salt Manufacturing Co, 1000 Widener Bldg, Philadelphia 7, Pa.* Neoprene coatings for severe corrosive conditions. Three coats build up thickness of five mils.

ANTI-RUST PAINTS—*Speco, Inc, 7308 Associate Ave, Cleveland, Ohio.* Now in red, gray, and green in addition to standard black, aluminum, and clear. Rustrem.

ELECTRIC SPRAY GUN — *Waldorf Sales Co, 363 Central Park Ave, Yonkers, NY.* Operates without compressor; delivers 90 psi at 7200 spm. Price: $17.95.

RUST PREVENTATIVE — *Enthone, Inc, 442 Elm St, New Haven, Conn.* Mildly alkaline, water-soluble compound said to leave no film on steel. Type NR-31.

ELECTRONIC PAINT SPRAYER — *Scientific Electric, Garfield, NJ.* Electronically charges paint within the spray apparatus. Said to produce extremely even finish. Standard voltage.

IMMERSION PROCESS — *Special Chemicals Corp, 30 Irving Place, New York 3, NY.* For ferrous metals, produces uniform finish resistant to solvents or high temperatures. Will not chip during welding, bending, or stamping.

ANTI-RUST PAINT — *Paint Corporation of America, Fidelity Building, Cleveland, Ohio.* Now in gray, red, and green in addition to black, clear, and aluminum. Paints over rust without scraping or primer.

RUST-INHIBITING PAINT—*L Sonneborn Sons, Inc, 80 Eighth Ave, New York 11, NY.* Said to outlast red lead and cost one third less. Said not to crack with expansion or contraction.

FIRE-RETARDANT PAINT — *Fyr-Kote Co, Div, Morris Paint & Varnish Co, 27th and Douglas, Omaha, Neb.* Applied by brush or spray; said to stop fire from spreading. Listed by Underwriters Laboratory.

COLOR CODE PAINT—*Crown Industrial Products Co, 713 Amsterdam Ave, Woodstock, Ill.* Packaged in 12-oz spray can; dries in 5 to 10 min; 12 opaque colors.

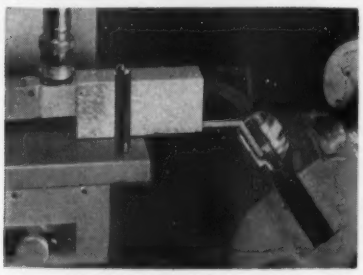
PROTECTIVE COATING — *Eagle Chemical Co, Industry Ave, Joliet, Ill.* Impervious to acids, alkalis, greases, and oils. For wood or metallic surfaces. Spray-Strip.

PRE-PAINT COATING—*Oakite Products Inc, 124 Rector St, NY 6, NY.* Zinc-phosphate coating for steel and iron; crystalline in nature. Cryscoat HC.

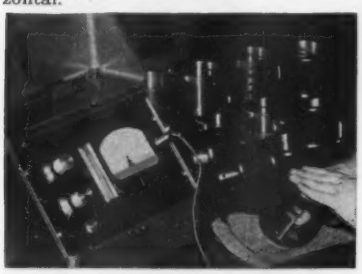
1954 LAYOUT AND INSPECTION

summarized from descriptions published during 1953

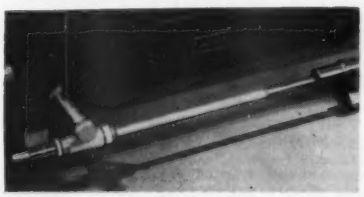
SURFACE MEASURING — *Engis Equipment Co, 431 S Dearborn St, Chicago 5, Ill.* Instrument traverses stylus of 0.0001 in. over area and, through an electronic amplifier, graph indicates nature of cross-section of surface. Magnifications are from 1000 to 50,000X.



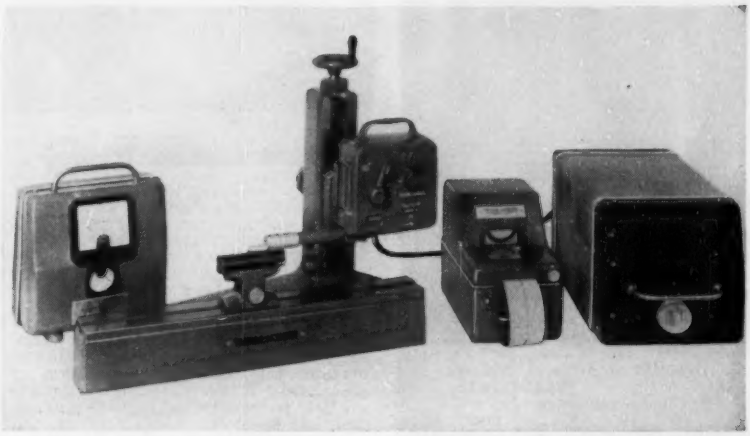
SURFACE ROUGHNESS — *Micrometrical Manufacturing Co, 345 S Main St, Ann Arbor, Mich.* For measuring internal tapers, across internal shoulders, and other surfaces that can only be reached with dogleg beam. Can also be used on internal and external surfaces where part can be mounted on linear pilotor with work surface horizontal.

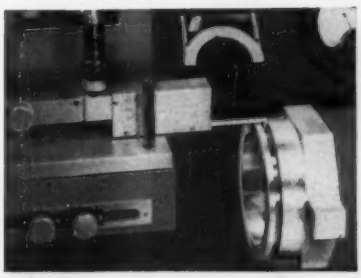


SURFACE INSTRUMENT — *Brush Electronics Co, 3405 Perkins Ave, Cleveland 14, Ohio.* Range is from 1 to 1000 mu-in. and amplified pickup is indicated directly on meter. Permits separation of waviness and roughness characteristics by filtering out wavelengths exceeding 0.0003, 0.010, or 0.030 in. Precision reference specimens provide accurate calibration.

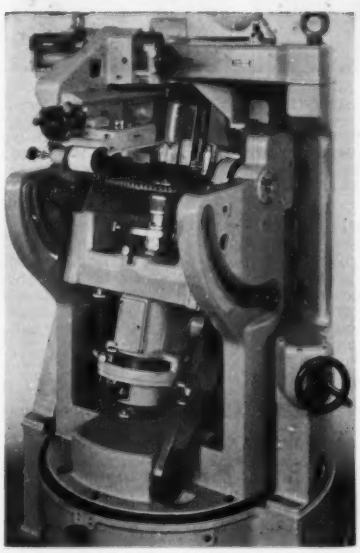


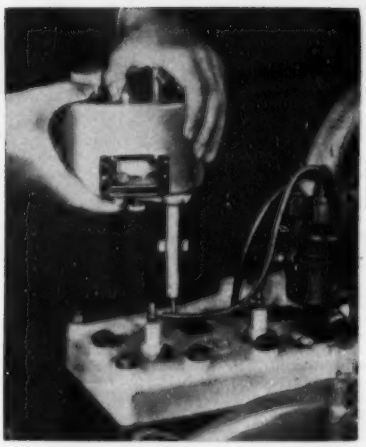
SMALL TRACERS — *Micrometrical Manufacturing Co, 345 S Main St, Ann Arbor, Mich.* Profilometer tracers take surface measurements in holes as small as ⅛ in., deep as 24 in., and with reading of from 1 to 75 mu-in. Tracers have integral link-arm available in three standard lengths. Can be used with Profilometer Amplimeter.





TRACER—*Micrometal Manufacturing Co, 345 South Main St, Ann Arbor, Mich.* For taking surface-roughness measurements across flat-bottomed grooves to ¼-in. depth. Can be used on OD or flat where part can be mounted on linear pilotor.





VIBRATION MEASURING — *Epic, Inc, 154 Nassau St, New York 38, NY.* Measures mechanical vibrations on machinery, shafts, cables, and springs; frequency range is from 0 to 250 cps. Amplitude range is from 0.00001 to 0.375 in. Recording is done by stylus on transparent wax-paper tape. German—Askania.

SURFACE SPECIMENS—*Acme Industrial Co, 200 N Laflin St, Chicago, Ill.* Individually finished to definite micro-inch readings and grouped together in finish-comparison bars. Round plug forms are 1x1 in.; rectangular blocks are 1x1½x1 in.

BEVEL-GEAR TESTING — *High Precision Products Co, Westfield, NJ.* Machine records tooth alignment, tooth thickness, tooth profile, and surface finish and measures cone and generating angle as well as lateral displacement. Cone angle, circular pitch, and lateral displacement are read optically. No. of teeth ranges from 16 to 120, pitch cone angle from 7 to 90°; max helix angle is 30°.

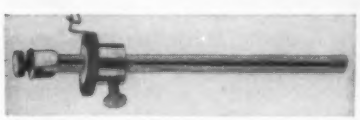
LAYOUT and INSPECTION—measuring equipment

MAGNETIC GAGE — *Nassau Distributing Co, Inc, Buick Bldg, 1633 Broadway, New York 19, NY.* For measuring thickness of coatings of metal, paint, plastic, or paper on ferrous surfaces. Must be calibrated for various objects. Variable-stength-magnets permit measurements within range from 0 to 3/16 in. Magnet-O-Gage.

TORQUE BALANCES — *Ohaus Scale Corp, 1950 Commerce Ave, Union, NJ.* Eliminate mechanical axle friction. Models range in capacity from 1 mg to 20 g with sensitivities from 0.002 to 0.02 mg.

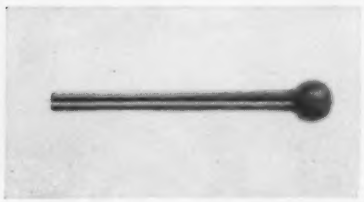
PRESSURE MEASURING—*Fischer & Porter Co, Hatboro, Pa.* Instrument can be equipped to operate over wide range of absolute, gage, or differential pressures. Accuracy is 1 part in 5000, sensitivity 1 part in 15,000. 5-in. dia, 14-in. length. Press-I-Cell.

MEASURING MACHINE — *Engis Equipment Co, 431 South Dearborn St, Chicago 5, Ill.* Measures lengths and diameters to 0.00005 in. by means of 4-in. glass scale. Worktable tilts and rotates.

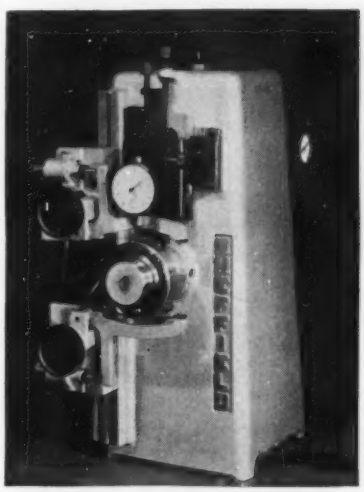


THREAD-WIRE HOLDER — *Scully Machine Co, 62 Walter St, Bridgeport, Conn.* Stem holds double wires and thimble supports single wire to simplify free-wire measurement of pitch diameter. Each stem is calibrated for one American Standard pitch.

LOAD CELLS—*Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* For measuring forces and weights based on SR-4 bonded resistance-wire strain gage. 18 cells have 9 capacities ranging from 500 to 200,000 lb (compression); 16 tension cells have 8 capacities ranging from 500 to 100,000 lb. Standard cells have accuracy within 0.15% of full-scale; extra-precision type have accuracy within 0.10%. Compression cells range from dia of 3 to 8 in.; tension cells from 3 to 9 in.



TOOLING BALL—*Flabob, Inc, 1301 W 1st St, Los Angeles, Calif.* Accuracy is ±0.0002 in. Consists of straight shank with ball welded on end. Shank is inserted in hole drilled at intersection of station lines during construction of jigs. Direct measurement can be made on line perpendicular to ball tangent. Ball has ½-in. dia.

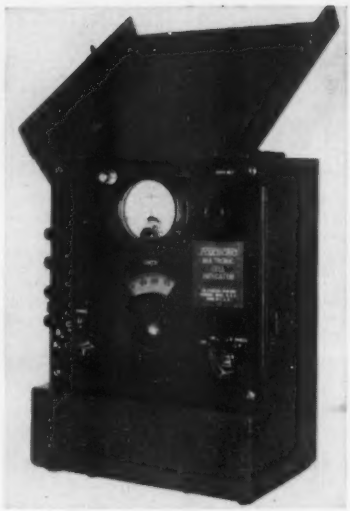


RADIAL PLAY—*The Sheffield Corp, Dayton 1, Ohio.* Two adjustable, pivotal, load-bearing arms alternately exert upward and downward pressure on bearing. Plunjet and Precisionaire may be used instead of dial indicators.

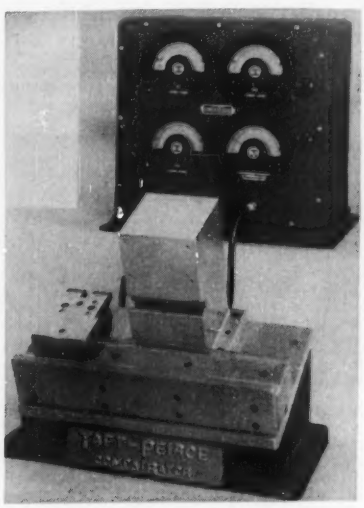
METAL REMOVAL GAGE—*The Sheffield Corp, Dayton 1, Ohio.* Plunjet cartridge, connected to Precisionaire, is mounted on infeed slide to indicate against fixed stop attached to stationary part of machine. Plunjet and float position are set up on part within tolerance.

←

THREAD DIAMETERS—*The Sheffield Corp, Dayton 1, Ohio.* Consists of two adjustable centers mounted on base and movable carriage with micrometer and reference-point indicator. Vernier enables measurements within 0.00001 in. to be made against standard. Dia capacities are 0 to 4, 0 to 7, and 6 to 12 in.



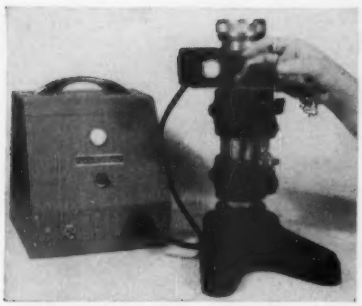
CHUCK-JAW FORCE — *The Foxboro Co, Foxboro, Mass.* Electronic. Indicates force in pounds or other units with accuracy of ±0.1%. Instrument is connected to cell held in jig mounted in chuck.



TURBINE-BLADE ROOTS — *Taft-Peirce Mfg Co, Woonsocket, RI.* Air-operated inspection gage measures dimensions over rolls of serrations in root section of jet-engine turbine blades. Dial graduations are 0.0001 in. for measuring; fourth indicator computes difference of amounts by which dimensions vary from mean value.

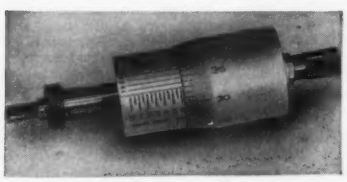
PISTON GAGE—*The Sheffield Corporation, Sheffield, Ohio.* Provides simultaneous gaging of piston-skirt dia in two places, taper from top to bottom, and of cam grind on skirt at three points. Consists of air-jet ring and two Plunjets connected to five-column Precisionaire.

VERNIER CALIPERS—*Glogau & Co, Inc, 1914 Birchwood Ave, Chicago, Ill.* Sizes from 10 to 96 in.; precision readings to 0.001 in. German—Schweitzer.



ELECTRONIC MICROMETER—*J W Dice Co, 1 Engle St, Englewood, NJ.* Measures to 0.00002 in. without exerting pressure. Designed for performance testing of diaphragms, bellows, and other controls requiring pressureless operation. Model W.

GROOVE GAGE—*Rimat Tool Co, 21 West Dayton St, Pasadena, Calif.* For measurement of thread reliefs, bypass reliefs, and bores as small as 0.310 in. Series P.



MICROMETER HEAD—*Boeckeler Instrument Co, 91 E Rillito St, Tucson, Ariz.* Leadscrew lapped to reduce error to 0.00001 in. Scale and vernier engraved on barrel; each division calibrates 0.00002 in. Back end of nonrotating spindle features a carbide wear tip.

SPINDLE MICROMETER HEAD — *Roeckeler Instrument Co, 91 E Rillito St, Tucson, Ariz.* Unit has 1-in. range and reads by vernier to 0.0001 in. Swiss-Tavannes Machines.

MICROMETER—*Tubular Micrometer Co, St James, Minn.* Hole locator has round, ground, and hardened anvil at right angles to spindle. Other uses are measuring the thickness of tubing, slots, and grooves.

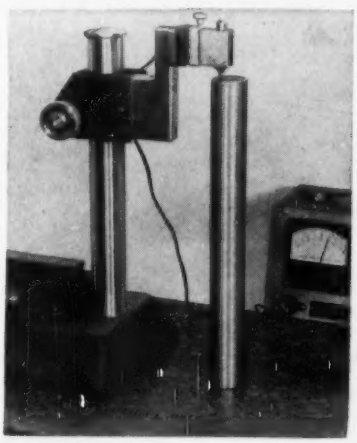
STAINLESS CALIPER — *Charles H Brown & Co, Inc, 82 Beaver St, New York 5, NY.* Measures ID, OD and depth to 6 in. Graduations mark 0.01 and 1/128 in. Price: $19.75.

HEIGHT GAGES — *Homestrand Inc, Larchmont, NY.* Universal clamp for any dial indicator. Sizes are 12, 18 and 24 in.

VERNIER CALIPERS — *Homestrand, Inc, Larchmont, NY.* Redesigned for handling ease and accuracy. Three sizes measure to 12, 24, and 36 in. Also 6-in. Mauser-type caliper with built-in depth gage.

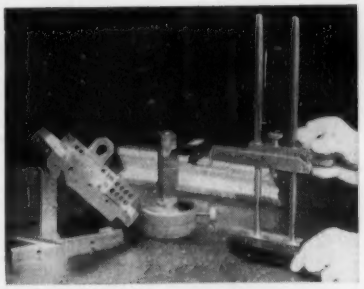
MICRO-HEIGHT GAGE — *Fairfield Gage Co, Inc, 182 Herbert St, Bridgeport, Conn.* HSS scriber can be reversed to extend capacity from 2 to 3 in. Scriber can be replaced with dial indicator.

HEIGHT GAGING — *The Sheffield Corp, Dayton, Ohio.* Consists of pick-up arm mounted on beam-actuating air jet connected to Precisionaire gage of as much as 5000:1 amplification. Determines flatness, parallelism, concentricity, and other geometrical features of parts resting on surface plate.

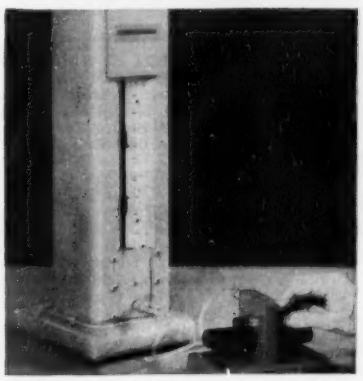


GAGE ATTACHMENT—*Cleveland Instrument Co, 735 Carnegie Ave, Cleveland, Ohio.* Adapts stand-and-anvil-type electronic production gage to wide range of surface-plate work. Head can be mounted to check bottom surfaces.

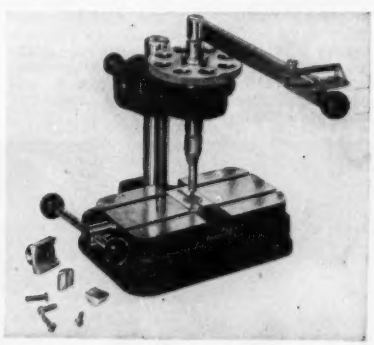
HEIGHT GAGE — *Electrolizing Sales & Tools, Inc, 1406 E 15th St, Los Angeles 21, Calif.* Reads to hundredths on barrel and thousandths on dial. Range is 0 to 2 in. Knob is knurled.



HEIGHT GAGE—*The Tietzmann Tool Corp, Englewood, Ohio.* Indicator height gage and adjustable inspection block are designed for precision layout work. Final adjustments can be made to millionths of an inch with one hand. Heights for the gage are 12, 24, and 36 in.; block is adjustable to 0.250 in.

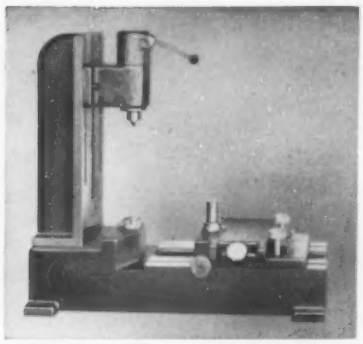


CYLINDRICAL GAGE—*The Sheffield Corp, Dayton 1, Ohio.* Air gage using air ring with three jets 120° apart. With 10,000:1 Precisionaire, diameter variation of 0.0003 in. will move float 3 in. in column.

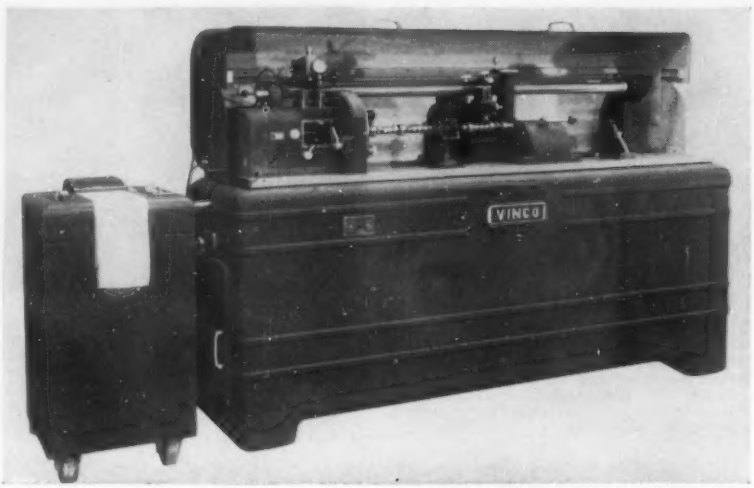


TORQUE FIXTURE—*P A Sturtevant Co, Addison, Ill.* Two models with capacities of 0-200 in.-lb and 0-150 ft-lb. Driving end of spindle is threaded so user may design special drivers.

DYNAMIC BALANCER—*Kurt Orban Inc, 205 E 42nd St, New York 17, NY.* Indicates location and magnitude of unbalance in oz-in. by measuring counter motion which must be introduced into bearings in which work rotates. Electronic amplifier in headstock includes rectifier and filter. Two handwheels, one for angle, the other for magnitude, control counter force.



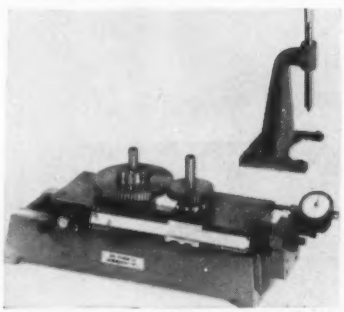
GEAR CHECKER—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Checks size, eccentricity, and roll smoothness of cluster gears and others having integral shaft. Center distance adjustable from 2 to 10 in.; indicator divisions are 0.0005.



TRANSMISSION-GEAR TESTER — *Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Model 1126 has one spindle driven while brake loads are applied to second. Model 1126A has individual drive and brake for each spindle. Double-action clutches change the spindle drive.

INVOLUTE CHECKER — *Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Handles spur or helical gears with pitch diameter to 36 in. and max spread between centers of 26 in. Single master disk is combined with sine bar to provide proper ratio between master disk and base dia of gear being checked. Deviation from involute is read directly on indicator.

UNIVERSAL GEAR TESTER — *Imported by Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* For checking spur, bevel, and helical gears, worms and worm gears, flat and round racks, pinion shafts, and finished gear assemblies. Rotates test gear against master; visual indication dial has sensitivity of 0.0001 in. Errors are indicated as total composite error and tooth-to-tooth composite error. Mechanical recorder can be attached which will give magnifications of 100, 200, 250, and 400. Geman—S & F.



SPUR-GEAR CHECKER — *George Scherr Co, 200 Lafayette St, NY 12, NY.* Reveals presence of burrs, errors in center distance, eccentricity, and spacing, and estimates backlash. Dial gage reads to 0.0005 in.; center distance is read to 0.001 in.

SERVO CHECKER — *Industrial Control Co, Wyandanch, LI, NY.* For rapid field maintenance without additional instruments. Servo Loop is adjusted until image on 3-in. screen aligns with specification on mask. Faulty servos will not align. Model 101-A.

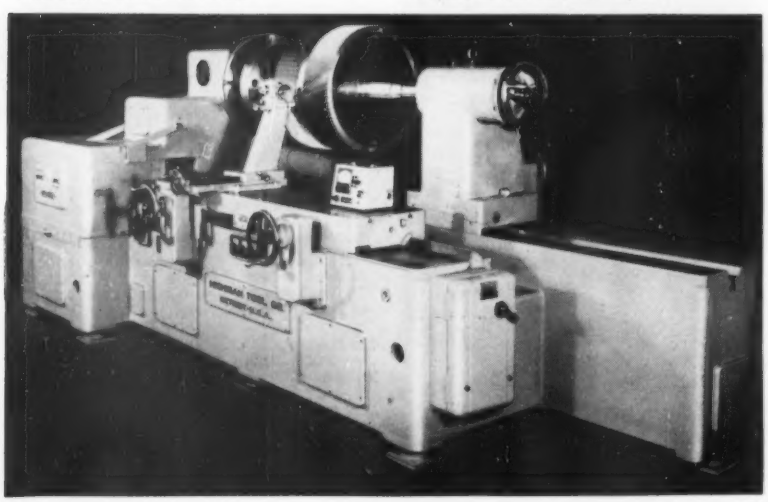
ENGINE CAMSHAFT CHECKER — *Vinco Corp, 9111 Schaefer Highway, Detroit 28, Mich.* Determines variances in cam contour by comparison with master gage lapped to accuracy of 0.0001. Indicates on dial and records on linear chart. Tooled for individual camshaft with capacity between centers ranging to 44 in., journal diameter to 2⅜ in.

SPUR GEAR TESTER — *Gleason Works, 1000 University Ave, Rochester 3, NY.* Tests running qualities as well as tooth spacing and concentricity. Drive spindle moves horizontally to 0.010 in. of center and calibrated spring applies pressure in 4-oz increments from 0 to 5 lb. Max OD of gears is limited by 4½-in. center distance between spindles. There is also an angular hypoid tester for testing bevel and hypoid gears with up to 4¼-in. dia. Range of shaft angle is 0 to 180°.

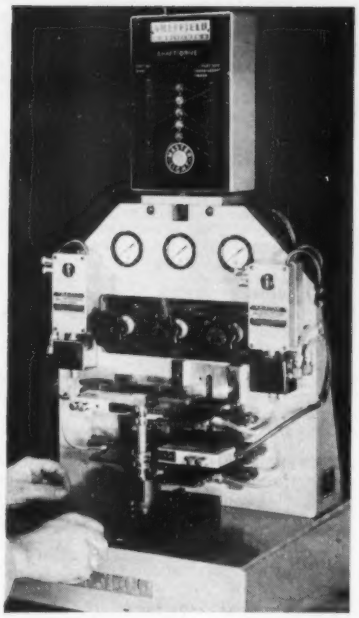
DYNAMIC BALANCING MACHINES —*Bear Manufacturing Co, Rock Island, Ill.* Model 353-R has shaft-dia range from ½ to 5 in.; model 375-R-HD from 1 to 8 in. Features are: dual pick-up controls, dual number drum openings, and redesigned flexing head and roller assemblies.

INDUSTRIAL BALANCER — *Merrill Engineering Laboratories, 1240 Lincoln, Denver, Colo.* Set up in less than two minutes; balances high-speed milling heads, cutters, and grinding wheels. Length range is 4½ to 55 in.; diametral capacity, ½ to 44 in. Price: $34.75.

DYNAMOMETER—*George L Nankervis Co. 19255 W Davison, Detroit 23, Mich.* Tests ac and dc motors; 3-hp rating at 1800 rpm; speed range to 4000 rpm. Unit includes self-regulating brake. Model 52 Custom.



← GEAR-CHECKING MACHINE—*Michigan Tool Co, 7171 E McNichols Road, Detroit 12, Mich.* Checks lead and axial pitch on large helical and herringbone gears as well as parallelism of teeth on large spur gears. Handles gears from 18- to 48-in. OD with max face width of 25 in. and shaft length of 96 in. Adjustable sine bar determines relationship between movement of indicator table and rotation of gear. Model 1248.



MULTIPLE GAGE — *The Sheffield Corp, Dayton 1, Ohio.* Simultaneously inspects five bearing diameters on drive shaft and lights indicate whether or not dimensions are within tolerance. Inspect shafts at rate of 600 to 800 per hr using min and max masters.

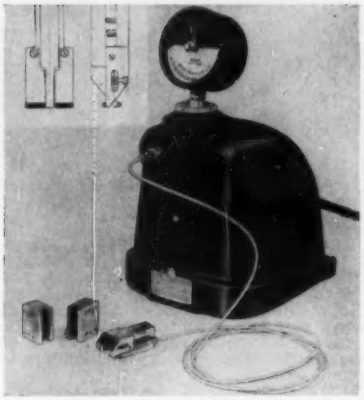
BUCKET BLADE — *Sheffield Corp, Dayton 1, Ohio.* Air gage assembly checks jet engine turbine bucket blades for blade taper in relation to root form at three places along leading and trailing edges and measures root form length, all in one step. Uses seven Plunjet cartridges and seven-column Precisionaire.

RING GAGE CHECKER—*The Sheffield Corp, Dayton 1, Ohio.* Gages lead, taper, straightness, and concentricity of straight and tapered plain and thread ring gages with up to 8-in. max Id and 10-in. max OD. Electronic amplifier has a magnification of 2000:1.

AIR GAGE—*Sheffield Corp, Dayton 1, Ohio.* Checks five dimensions on oil pump body; consists of three air spindles and five-column Precisionaire. Special spindle checks depth and parallelism of inside surface; each of the other two gages a bore dia, radius, and concentricity.

THREAD LEAD CHECKER — *The Sheffield Corp, Dayton 1, Ohio.* Measures internal and external threads up to 8-in. dia and 18-in. length. Magnification is 400 to 1; micrometer screw has 40 tpi.

BALL BEARING GAGE — *Sheffield Corp, Dayton 1, Ohio.* Quickly and accurately separates ball bearings into one of ten dimensional classes after gaging. Balls are gravity fed from V-trough into receiving hole in slide. Ball sizes can be classified in increments of 0.000010 in.



BLADE CARRIER GAGE—*Pratt & Whitney Div, Niles-Bement-Pond Co, West Hartford 1, Conn.* Checks pitch diameter of internal root forms on jet-engine blade carrier. Used with model F comparator.

MAGNIFYING GAGE—*Pratt & Whitney, Div Niles-Bement-Pond Co, West Hartford, Conn.* Air gage uses standard gaging plugs. Magnification of 500 or 10,000X. Air-O-Limit Model G.

ELECTROLIMIT COMPARATOR — *Pratt & Whitney, Div Niles-Bement-Pond Co, West Hartford 1, Conn.* Includes electrolimit circuit, gage block comparator stand, and electronic recorder to provide 110,000:1 magnification. Equipped with pen lifter and chart drive switch.

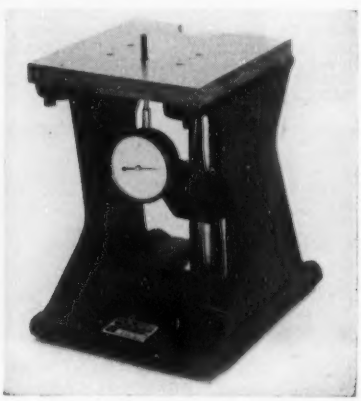
DIAMETER GAGE—*The Taft-Peirce Mfg Co, Woonsocket, RI.* Applies variations in dia to both sides of reading. Taper, concentricity, and clearance are read on one dial with one reading.

ELECTROLIZED GAGES—*The Taft-Peirce Manufacturing Co, Woonsocket, RI.* Hard, non-magnetic alloy coating is 0.000025 in. thick. Surface reduces friction and is corrosion-resistant.

THREAD-GAGING UNIT—*The Taft-Peirce Manufacturing Co, Woonsocket, RI.* Bench model; checks internal threads up to 0.510 in. Gaging assembly is mounted directly on electric motor unit. Reversal of applied pressure causes disengagement or reversal of drive, as desired.

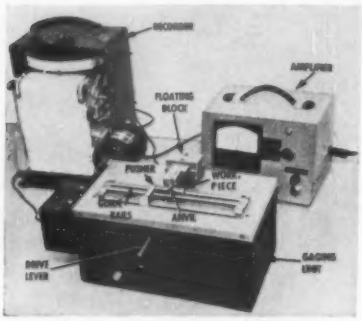
MECHANICAL COMPARATOR—*The DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* For production checking operations. Leadscrew provides coarse adjustment and there are two fine adjustments: thumbscrew moves head up or down, lever moves dial scale from left to right. Unit can be used with surface plate; special spindle tips and accessory kit are available. Producto-Chek.

ELECTRONIC COMPARATOR—*Federal Products Corp, 1144 Eddy St, Providence 1, RI.* Selection of four magnifications on same dial: 500:1; 1500:1; 5000:1; and 15,000:1. Capacity ranges from 0.125 to 10.000 in. for inside measurements; outside measuring range is from 0.000 to 9.000 in. Gaging pressure is 8 oz.



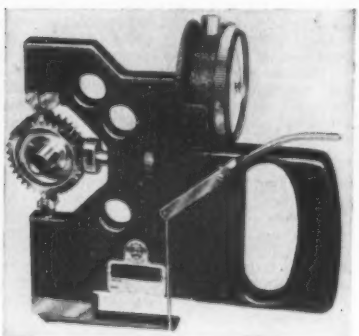
BENCH COMPARATOR—*Acra-Ment Gage Division, Meyer Corp, Cranston, RI.* Measures height, depth, thickness, counterbore depths, and offsets. Measurements are made possible by over-and-under feature of column and indicator in reference to platen. Tapped holes are provided to accommodate gaging fixtures.

BENCH COMPARATOR—*Acra-Ment, Gage Division, Meyer Corp, Cranston, RI.* For quick gaging of ID or OD on production runs. Jaw arrangements can be designed to meet specific requirements. Model K7-R.

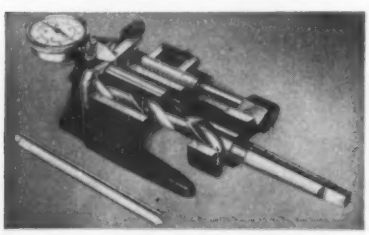


SPECIAL GAGING EQUIPMENT — *Cleveland Instrument Co, 735 Carnegie Ave, Cleveland, Ohio.* Inspects cylindrical pins, checking dia at four points within ±0.000005 in. Gages pieces 2 in. long at rate of 120 per hr.

DIAL BORE GAGES—*Rimat Tool Co, 21 West Dayton St, Pasadena 2, Calif.* Interchangeable gage heads. Set includes gages for measuring O-ring grooves, snap-ring grooves, pitch diameters of internal threads, and small bores.



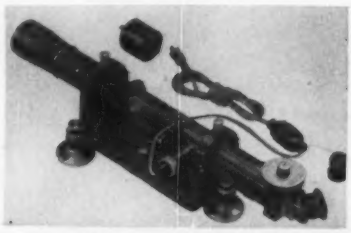
PITCH-DIAMETER GAGE — *Nilsson Gage Co, Poughkeepsie, NY.* Free-floating interchangeable anvils; retracting lever collapses gaging roll to clear OD of gear or spline. Equipped with 0.0001-in. indicator.



DRILL POINT GAGE—*Engis Equipment Co, 431 S Dearborn St, Chicago 5, Ill.* Checks drill point angle and concentricity; reads to 0.001 in. and to 1°. Sizes: ¼ x ⅜ or ⅜ x 2½ in.

GAGE ACCESSORY SET — *Webber Gage Co, 12900 Triskett Rd, Cleveland, Ohio.* To permit Webber standard gage blocks to function as tool. Units can be combined to serve as snap, ring, or height gages, calipers, and scribers for dimensions under 12 in.

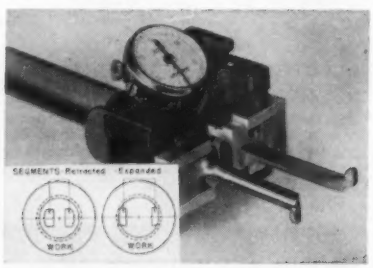
HEIGHT COMPARATOR—*H E Dickerman Manufacturing Co, 32 Albany St, Springfield, Mass.* Used as gage, comparator, or scriber. Column lengths of 18 or 24 in.



AUTO-COLLIMATOR—*Engis Equipment Co, 431 S Dearborn St, Chicago, Ill.* Tests straightness, squareness, and parallelism to 0.0000025 in. per in. Readings can be made on standard unit in any plane—horizontal, vertical, or inclined; accessory allows checks to be made in direction perpendicular to unit axis.

RECOIL CYLINDER CHECKER—*J N Fauver Co, Inc, 49 W Hancock, Detroit 1, Mich.* Test stand checks cylinders for hydraulic pressures from 3000 to 5000 psi.

BENCH CENTERS—*Fearless Tool Co, 7045 Darby Ave, Reseda, Calif.* Provide accurate holding means for inspection purposes. Dial indicator shows runout. Max center distance is 8 or 14 in.



GROOVE GAGE — *Bryant Chucking Grinder Co, Springfield, Vt.* Portable. Checks dia and roundness of internal grooves with diameters up to 5 in. and located to depth of 1 or 2 in. from a face. Checking is done by pair of segments mounted on platforms, one of which is movable. Precision dial indicator shows variation from basic size.

SPRING TENSION—*Imtra Corp, 58 Charles St, Cambridge, Mass.* One-hand tension gages have range from 4 to 2500 g. Gage is preset to required tension by knurled micrometer screw; deflection of operating strip at same time resistance element moves, indicates setting equals force. British—G E C.

INSPECTION UNITS—*Swanson Tool & Machine Products, Inc, Erie, Pa.* Includes surface plate, bench centers, V-blocks, sine plate, and indicator attachment. Surface plate has 12- or 24-width ground to 0.001 in. or scraped to 0.00025 in.

CHART-GAGES — *Optical Gaging Products, 26 Forbes St, Rochester 11, NY.* Permanent lines on 0.050-in.-thick Vinylite. Charts are dimensionally stable.

STRAIGHT EDGES—*Collins Microflat Co, 2326 E 8th St, Los Angeles 21, Calif.* Black granite; lengths to 48 in. check flat surfaces with accuracy of 0.00005 in. Ends are tapered and fitted with leather grips.

CIRCULAR GAGE BLOCKS — *Transocean Trading Co, 6453 Santa Conica Blvd, Dept AM, Los Angeles 38, Calif.* Nine-piece set makes up into 331 combinations. 1-in. dia gages are said to provide increased gaging surface due to circular form. When rung together they form a rigid round bar.

AIR SNAP GAGE—*Federal Products Corp, 1144 Eddy St, Providence 1, RI.* Anvils are tungsten carbide; air jet is located in anvil assembly and does not contact work. Dial gives direct reading to nearest 0.00005 in. Five sizes cover range from 0 to 6 in.

PLUG GAGE SET—*Deltronic Corp, 9010 Bellanca Ave, Los Angeles 45, Calif.* 25-gage set: one is nominal size, 12 are increasingly larger in 0.0001-in. increments, and 12 increasingly smaller in same increments. Nominal sizes vary from ⅛ to 1 in. in increments of 1/64 in.

CENTERING-SIZE DISKS—*Standard Gage Co, Inc, Poughkeepsie, NY.* Set of 27 disks for use with No. 00 dial bore gage. Extensions cover ¼ to ⅜ in. and total tolerance as great as 0.005 in.; will check to within 1/16 in. from bottom of blind hole.

INSPECTION CYLINDERS — *Reid Tool Supply Co, 332 W Delano Ave, Muskegan Heights, Mich.* Both welded ends of seamless steel tubing are square with body. Units are carburized and hardened, are easier to handle than solid steel squares.

GAGE BLOCKS—*Fonda Gage Sales Corp, 38 Broad St, Port Chester, NY.* Steel, carbide, or chrome carbide. Number is etched on ground band on larger blocks.

GAGE HANDLE—*Size Control Co, 2500 W Washington Blvd, Chicago 12, Ill.* Universal; for go and no-go plain and thread plug gages from 0.010 to 0.750 in. Handle is anodized aluminum.

FEELER GAGES—*J H Williams Co, Buffalo 7, NY.* Blades from 0.0015 to 0.040 packaged six to an envelope in 3½- and 12-in. lengths. Each blade is etched with decimal size. Ten gage sets are also offered.

MICROMETER GAGE SET — *The DoAll Co, Des Plaines, Ill.* Checks 1- and 2-in. micrometers; includes gage blocks of 0.25, 0.65, and 1.000 in. Two optical parallels of fused quartz provide method of checking condition of spindle and anvil faces.

SNAP GAGE — *HVH Tool & Instrument Co, 150 Lafayette St, New York, NY.* Adjustable to limits; available in variety of sizes and ranges.

GAGE HANDLE — *Size Control Co, 2500 W Washington Blvd, Chicago, Ill.* For reversible, plain and thread plug gages. Eight-handle set takes plugs with dia from 0.010 to 0.750 in.

REVERSIBLE PLUG GAGES—*S & E Machine Products, Inc, Bridgeport, Mich.* Extended range of these tungsten carbide gages includes diameters to 0.760 in. Available in tolerance classes XX, X, Y, and Z.

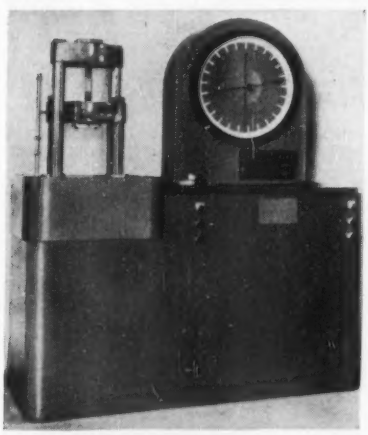
TEMPERATURE CHAMBER — *Industrial Freezer Div, Webber Mfg Co, Inc, Dept 00240, 2740 Madison Ave, Indianapolis 3, Ind.* High-low bench-type temperature test chamber has range from —80 to +185 F; pull-down to low temp is accomplished in 30 min. Test chamber is 12-in. cube. Application of heat is accomplished by reverse-cycle refrigeration.

TEST CHAMBER — *Murphy & Miller Inc, 1326 S Michigan Ave, Chicago, Ill.* Temperature range is from —130 to +200 F and humidity cycle is 20 to 95% between 35 and 185 F. Forced air circulation system; stainless steel test space; electrical defrost system; automatic pump-down control. Five models have capacity ranging from 4 to 36 cu ft.

CHILLING UNIT — *Sub-Zero Products Co, 3930 Reading Road, Cincinnati 29, Ohio.* Said to be unusually compact for chamber capacity. Sizes from 1.5 to 5 cu ft hold any temperature from —10 to —70 F. Series XV-70.

SPRING TESTER—*The Carlson Co, 277 Broadway, New York 7, NY.* Capacity, 100 lb; rate, 400 to 600 tests per hr; tests springs with dia to 4 in. and length to 12 in. 15-in. dial has accuracy of 0.25%.

SPRING TESTER—*Engineering Dept, John Chatillon & Sons, 85-93 Cliff St, New York 38, NY.* For spiral and torsion springs up to 1 in. long and 2-in. OD. Tests capacity to 2000 g-cm in increments of 0.1 g-cm. Model 735-S.



TESTING MACHINES — *Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* Two models provide 12,000 or 60,000 lb for tensile load testing. Speed can be varied between 0 and 2 ipm on the large model, between 0 and 4 on the smaller. Design prevents shock being transmitted to indicator.

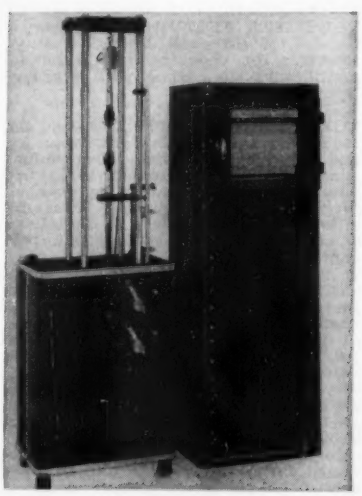
EXTENSOMETER — *Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* For specimens of ½-in. width with 0.005 to 0.25-in. thickness. Magnifications of 250, 500, 1000 over measuring range of .04 in.

TORSION TESTING — *Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* Device produces torsion on tension testing machine. Twists test specimens from 2 to 12 in. long through max angle of 24°. Max torque load is 60,000 lb, obtained by applying 12,000-lb tension load.

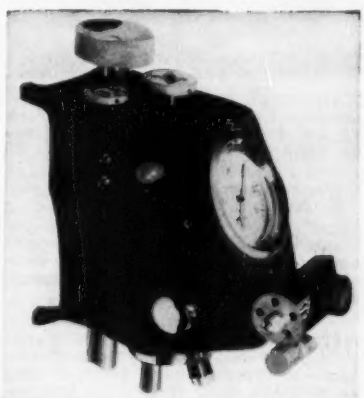
COLD TEST CHAMBER — *Sub-Zero Products Co, Cincinnati 29, Ohio.* Sizes from 1.5 to 4 cu ft with temp range from —10 to —120 F. Circulators are available for close control. Instrumentation is provided as needed.

SPINTESTING EQUIPMENT — *Warren Brothers Manufacturing Div, Warren Brothers Roads Co, Cambridge, Mass.* Produces abnormal centrifugal forces by high-speed rotation of parts. Model VHS-1 tests 2500 lb at 25,000 rpm; VHS-2 tests 200 lb at 60,000 rpm; VHS-3 tests 15 lb at 100,000 rpm.

TORSION TESTER—*John Chatillon & Sons, 85 Cliff St, New York 38, NY.* Capacity is 40 g-cm and dial graduations read 2 g-cm. Tests torque at which two shafts will slip. Built around Iso elastic spiral spring seated in two bearings. Model N935.



CHILLING MACHINE — *Sub-Zero Products Co, Reading Rd at Paddock, Cincinnati 29, Ohio.* Operates at temperatures from —70 to —150 F; chilling chamber is 18x30 in. and 33-in. deep. Externally-mounted agitator speeds and controls flow of convection fluid. Model R-120.



HARDNESS TESTER — *C Tennant, Sons & Co, 100 Park Ave, New York 17, NY.* Portable; measures diagonals of impression with accuracy of 0.001 mm. Load can be set at any point from 1 to 30 kg. Penetrascope.

TORQUE TESTER — *Baker Co, Inc, Maplewood, Me.* For comparing breakaway, starting, and running torque. Single control enables operator to smoothly raise voltage until it just starts the ball bearing. Price: $800.

TENSILE TESTER — *Thwing-Albert Instrument Co, Penn St at Pulaski Ave, Philadelphia, Pa.* Electro-hydraulic with full-scale load ranges from 5 gr to 5000 lb. Standard rates of extension are from 0.1 to 20 ipm. Electronic recorder is in separate cabinet.

TESTING UNIT—*Young Testing Machine Co, Skelton Bldg, Bryn Mawr, Pa.* For large pieces of work; machine pad bed of 4x15 ft; capacity of 200,000 lb. Loading speed varies from 0.025 to 0.5 ipm; traverse speed is 15 ipm.

HARDNESS TESTER—*Newage International, Inc, 235 E 42nd St, New York 17, NY.* Portable. Direct dial readings on Rockwell 15N scale from 70 to 95.

MOTORIZED HARDNESS CHECKER — Both standard and superficial tester have been motorized. Instruments use motor and cam arrangement and are equipped with automatic zero-setting dial gage. Vertical gaps spaces are 3¼, 8, 12, or 16 in.

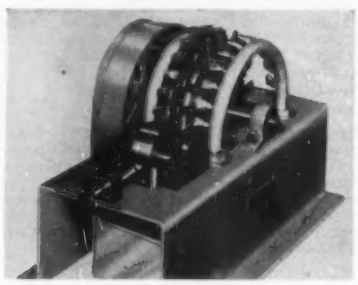
HARDNESS TESTER—*Blosjo Enterprises, 5310 Golden Valley Road, Minneapolis 22, Minn.* Bolts to bench or used as portable unit. Has 12-in. gap capacity and 4½-in. throat. Range of 20 to 500 Brinell.

HARDNESS TESTER — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Said to be smallest operating on rebound principle. Indicates within 1 pt R_c and chart permits quick conversion to other scales. Model M leaves no surface indentation; Model D is for rougher usage. Price: $65 and $75. German—Sklerograf.

HARDNESS TESTER ADAPTER — *Newage International, Inc, 235 E 42nd St, New York 17, NY.* Bench adapter for Newage portable metal hardness tester. Dial provides direct reading of hardness. Unit is calibrated to Rockwell A, B, or C, and 15N ranges. Price of bench adapter is $49.50. British—Newage.

CASTING LEAK TESTER—*Hautau Engineering Co, 721 Wanda, Ferndale 20, Mich.* Also detects leaks in brazed, welded, and soldered assemblies. Air-operated, electrically controlled; loss of air pressure is indicated by signal lights.

CASTING LEAK TESTER — *Planet Products Corp, 6305 Warrick St, Cincinnati, Ohio.* Hydrostatic tests for leaks in small castings and inter-drilled passages in variety of parts. Hand-pumped pressures to 1000 psi; volume per stroke is 1 cu in.



HEAT RESISTANCE — *Henry G Keshian, Hotchkiss Grove, Branford, Conn.* Determines relative resistance of different materials to heat checking. Cycle of heating, stressing, and cooling is repeated until specimen cracks. Checks 18 pieces at a time. Thermo-Test.

TUBE-TEST FIXTURE—*J N Fauver Co, Inc, 49 Hancock, Detroit 1, Mich.* Provides for checking four tube assemblies at same time with pressure from 80 to 100 psi.

TUBING TESTER—*The Dommers Co, 428 S Cherry St, Wallingford, Conn.* Air and hydraulically actuated. Determines characteristics of seamed tubing to 3-in. dia. Specimens can be checked for flaring, column, and crushing strength with pressures to 100,000 lb. Operates by solenoid with pushbutton control.

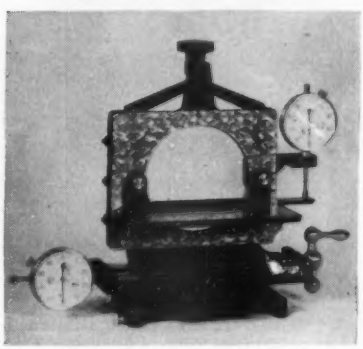
TEST PLUGS—*Imperial Brass Manufacturing Co, 1200 W Harrison St, Chicago 7, Ill.* For temporary plugging of tube ends; will hold pressures to 100 psi. Cannot be used with materials which deteriorate synthetic rubber.

GYRO CALIBRATOR—*Genisco, Inc, 2233 Federal Ave, Los Angeles 64, Calif.* Rate-of-turn table operated by synchronous motor and friction drive. Speed varies from 0.01 to 1200 deg. per sec.

LOCATING MICROSCOPE—*The Perkin-Elmer Corp, Norwalk, Conn.* Attaches to machine tool; provides 30X magnification. Roof prism incorporated in optical system erects the image. Field of vision includes ¼ in. Model 11.

INVERTED MICROSCOPE—*William J Hacker Co, Inc, 82 Beaver St, New York 5, NY.* Magnifications ranging from 40 to 2200x. 15x15-cm mechanical stage traverses in two directions with scales and verniers. Fine adjustment by micrometer screw with 0.001-mm measuring drum.

MICROMETER-LEVEL — *Engis Equipment Co, 431 South Dorborn St, Chicago, Ill.* Determines whether points in large fixtures or machines lie in level plane. Optical micrometer reads directly to 0.001 in. over range of 0.25 in. Model B131A.



COORDINATE STAGE—*Portman Instrument Co, Inc, 6 Manhasset Ave, Port Washington, NY.* For bench optical projectors or any optical comparator. Provides 1-in. longitudinal, vertical, and focusing travel.

COORDINATE STAGE—*Portman Instrument Co, Inc, 6 Manhasset Ave, Port Washington, NY.* For Portman model C-100 optical comparator. Travels 1½ in. longitudinally and 1 in. transversely.

SURFACE INSPECTION—*William J Hacker & Co, Inc, 82 Beaver St, New York, NY.* Interference equipment includes Reichert camera microscope and instrument in one unit. Determines surface irregularities of order of 0.1 to 0.05 of light wavelength.

MICROSCOPE — *Opplem Co, 352 Fourth Ave, New York 10, NY.* Magnifications from 4 to 3000 can be run with continuity on ground glass screen of camera. Eye-piece viewing and photographing by both still and movie camera can be done simultaneously. Projection on 40-in. screen can also be done at same time. Stage rotations read to 10 minutes and orthogonal movements read to 0.1 min. Italian—Galileo.

MICROSCOPE-METALLOGRAPH — *Opplem Co, 352 Fourth Ave, New York 10, NY.* Occupies volume of 13x13x8 in. Permits visual observation at magnifications to 1000X, and photographic and projection observation to 1500X. Supplied with reflex or Polaroid camera. Equipped with coarse focusing and micrometric movement for fine focus registering to two microns. Model CSF.

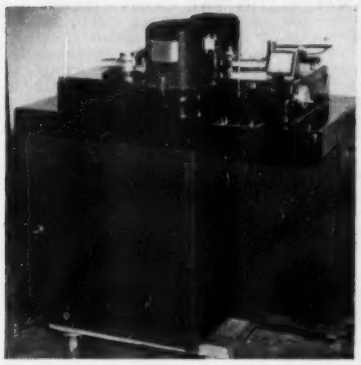
MEASURING MICROSCOPE—*National Instrument Co, Baltimore, Md.* Two models. 20-power unit has 0.580-in. field of view and measuring scale reading directly to 0.002 in. 40-power has 0.290-in. field and reads to 0.001 in. Equipped with swivel-mounted workholding vise.

CONTRAST MICROSCOPE — *R Y Ferner Co, Inc, 110 Pleasant St, Malden 48, Mass.* Said to be only bench-type instrument offering incident-light phase-contrast technique of observation. Instant interchange between bright and dark field and positive and negative phase contrast. British—Coeke.

MICROSCOPE — *Edmund Scientific Corp, 211 E Gloucester Pike, Barrington, NJ.* Two sets of paired objectives provide power range from 15X to 60X. Prism erecting system, rack and pinion focusing, adjustable for extra height to 11 in. Price: $125.

STEREO-MICROSCOPE — *Edmund Scientific Corp, 211 E Gloucester Pike, Barrington, NJ.* Fixed free-power objective with three pairs of matched eyepieces for powers of 15, 30, and 45X. Has interpupillary adjustment. Price: $7500. Stock No. 70,011.

AMPLIFYING GAGE—*George Scherr Co, 200 Lafayette St, New York 12, NY.* Uses master; combines optical and mechanical principles to give total amplification of 1000:1. Diameter capacity is 6 in. Oversize parts are shown as green and undersize as red. Dial is graduated to 0.00005 in. with range of 0.005 in. German—E Leitz.



X-RAY SPECTROMETER—*Research & Control Instruments Div, North American Philips Co, 750 S Fulton Ave, Mount Vernon, NY.* Geiger counter unit for production control. Equipped with air-cooled X-ray tube and goniometer with radius of 130 mm. Reads directly in degrees and hundredths over range from —10 to +90°.

RADIOGRAPHY EQUIPMENT — *X-ray Div, North American Philips Co, Inc, 750 S Fulton Ave, Mt Vernon, NY.* Specifically designed to meet industrial requirements for radiographic and fluoroscopic examinations. 150 KvP unit penetrates 2 in. of steel; 300 KvP unit penetrates 4 in. Setup consists of generator, control cabinet, tube, and handling device.

X-RAY UNIT—*Non-Destructive Testing Div, North American Philips Co, Inc, 750 S Fulton St, Mt Vernon, NY.* Portable; designed for rapid inspection of welds, pipelines, ship, and aircraft equipment. Arrangement of tube and generator in one housing eliminates need for high-tension cables. Power supply is 115 or 230 v. Model MG 160.

RADIOGRAPHY SOURCE — *Tracerlab, Boston 10, Mass.* For high-sensitivity testing of steel from ¼ to 1 in. Low-energy gamma rays of Iridium-192 allow thin sections to be radiographed.

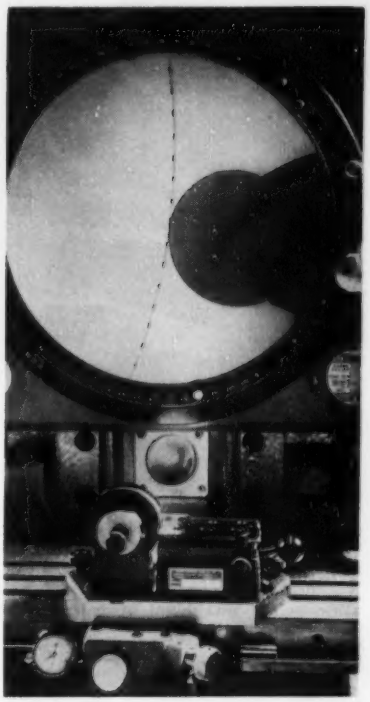
POCKET COMPARATOR — *Edmund Scientific Corp, Dept 211, Barrington, NJ.* Size is 1½x2 in.; gives 6X magnification. Reticle is calibrated. Price: $22.50.

MAGNIFIER — *Larrimore Sales Co, Mfg Div, PO Box 1234, St Louis, Mo.* Six-power; semi-achromatic; sharp-focus. Lens area is 1¾ in. Model 220 B.

MAGNIFIER — *Abbeon Supply Co, 179-27R Jamaica Ave, Jamaica 32, NY.* Seven-power unit is equipped with Bausch & Lomb lens and has flashlight in the handle. Price: $14.85.

ULTRASONIC METROSCOPE—*J W Dice Co, Englewood, NJ.* Redesigned to improve signal-to-noise ratio, picture clarity, and line voltage correction. Model MS-101.

MICROSCOPE-READER — *Pacific Transducer Corp, 11921 W Pico Blvd, Los Angeles, Calif.* Measures dia of indentations made by ball indentors of hardness-testing machines; can also test accuracy of machine itself. Magnification is 20X. Price: $56.50.



OPTICAL GAGING OF CAMS—*Optical Gaging Products, Inc, 26 Forbes St, Rochester 11, NY.* Staging fixture for use with Kodak contour projector allows infinite number of points to be checked with tolerance of 0.0005 in. Entire contour can be checked in 40 sec by inexperienced operator. Setup uses master cam and projection of contour and tolerance lines.

GEAR ANALYZER — *Optical Gaging Products, Inc, 26 Forbes St, Rochester 11, NY.* Gear rotates in contact with composite rack and magnified image is projected on Kodak contour projector. Setup allows inspection, analysis, and gaging of gears, including tapered and assymetrical teeth.

X-RAY UNIT—*Holger Andreasen, Inc, 703 Market St, San Francisco, Calif.* 250 KvP unit eliminates high-tension cables, cooling connections, separate transformers, and cooling pumps. Penetrates 4 in. of steel. Reported to be only industrial X-ray to operate on 110 v.

ELECTRONIC INSPECTION—*Standard Electronics Research Corp, 2 East End Ave, New York, NY.* Setup checks rocket shells for charge void or reduction in thickness of shell wall. Shell is moved helically through X-ray beam which impinges on crystal and ultimately produces paper trace. No photographic film is used and cost is reportedly ¼ that of radiography method.

SPECTROSCOPE—*William J Hacker & Co, Inc, 82 Beaver St, New York 5, NY.* Spectrum is generated by electric arc for analysis within range of visible wave lengths. Available with one or two specimen tables and attachment which makes instrument portable. Steeloscope.

LAYOUT and INSPECTION—optical equipment, controllers and indicators

MONOCHROMATIC UNIT—*DoAll Co, Des Plaines, Ill* Generator has 24-in. work height and head of instrument can be swung in 160° arc from side to side. Light of 20 ft-candle intensity is generated by mercury vapor.

BLACK LIGHT UNIT — *Ultra-Violet Products, Inc, 145 Pasadena Ave, South Pasadena, Calif.* 100-w long-wave (3660 AU) hand lamp operates on standard current and throws 30-ft beam of ultra-violet light. Price: $79.50.

MONOCHROMATIC GENERATOR—*DoAll Co, Des Plaines, Ill.* For inspection of finish and size with optical flats; small unit is particularly adaptable for use at production machines and inspection stations. Magnetic shielding is composed of aluminum. Head will rotate 360° around the column.

FLUORESCENT UNITS — *Stocker & Yale, Inc, Marblehead, Mass.* Portable; with or without magnification; can be quickly altered for ultra-violet radiation; twin lamps have 7500-hr rate of life.

FLUOROSCOPE—*X-Ray Dept, General Electric, 4855 Electric Ave, Milwaukee 14, Wis.* Designed for mass inspection of light alloy castings. Parts in the X-ray beam are moved lengthwise or crosswise by single lever. Standard electric supply.

BLACK LIGHT UNIT — *Burton Mfg Co, 11201 West Pico Blvd, Los Angeles 64, Calif.* Weighs 30 oz, measures 7x5x2-in. Features twin tubes; can use white fluorescent tubes.

INSPECTION MIRRORS — *F P Kretchmer, 3540 Dunn Drive, Los Angeles 34, Calif.* Similar to dental mirrors. Available in round or rectangular types; handles vary from 9½ to 18½ in. Adjustable within arc of 45°.

INTERNAL INSPECTION—*Eder Instrument Co, 2295 Clybourne Ave, Chicago, Ill.* Tube can be inserted in ½-in. opening and has 60 precision lenses as well as strong light. Control wheel curves tube to fit around corner.

ANALOG-DIGITAL CONVERTER — *Consolidated Engineering Corp, 300 N Sierra Madre Villa, Pasadena 8, Calif.* Directly converts test measurements from pressure pickups, thermocouples, and strain gages to numerical values. Accurate to 1 part in 1000; can be printed on tape or punched into cards. Sadic.

PROBE-LIGHT—*U S Electric Manufacturing Corp, 222 W 14th St, NY 11, NY.* 1000-ft beam and flexible slide-out side arm. Over-all extension of probe-light arm is 10½ in.

DYE PENETRANT—*Magnaflux Corp, 5900 Northwest Highway, Chicago 31, Ill.* Sprays from pressure can. Best adapted to local areas or remote locations.

PENETRANT INSPECTION — *Turco Products Inc, 6135 S Central Ave, Los Angeles, Calif.* Kit includes pint of die penetrant, 2 pints of remover, 2 developer press-spray containers, pint of developer, 3 brushes, and magnifying glass.

PENETRANT DYE—*Met-L-Chek Co, 121 N Prairie Ave, Hawthorne, Calif.* For detecting defects in metal, glass, and most plastic surfaces. Kits cost about $5.

PYROMETER CONTROLLERS—*The Bristol Co, Waterbury, Conn.* Actuate relays, solenoid valves; provide close temperature control of furnaces, plastic molding machines, and other heating equipment. Temperature range from 400 to 3000 F.

THERMOSTAT—*Fenwal Inc, Ashland, Mass.* Controls heating rate from 10 to 100 degrees per minute; can be used in ambient temperature between —100 and +550 F. Electrical rating is 5 amp at 115 v ac or 2 amp at 28 v dc.

THERMOBALANCE—*R Y Ferner Co, Inc, 110 Pleasant St, Malden 48, Mass.* Continuously weighs small samples throughout heat-time cycle and records changes in weight. Useful in corrosion studies. Chevenard.

THERMOSWITCH—*Fenwal Inc, Ashland, Mass.* For precise temperature control and overheat detection in instruments and mechanisms where minimum volume and weight are important. Range from 0 to 200 F.

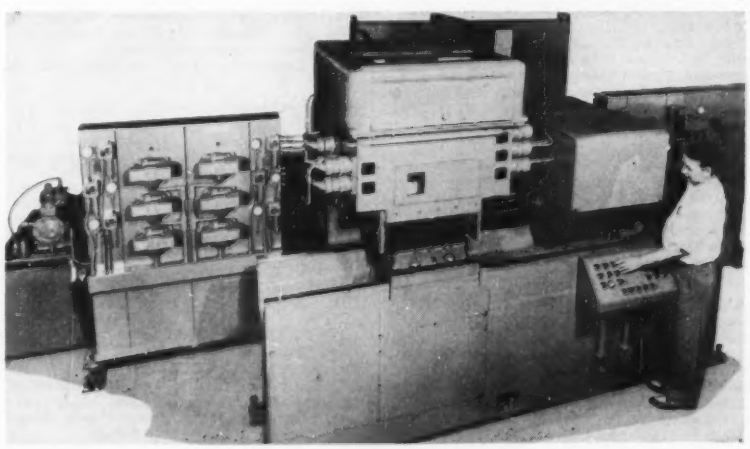
BATH TEMPERATURE — *Service Metal Fabricators Co, 350 N Foothill Rd, Beverly Hills, Calif.* Constant temperature bath machine maintains temperature with max variation of ¼ F. Machine was developed because formula correcting for coefficient of expansion is not sufficiently accurate to deal with 0.001 in. tolerances in cylindrical aluminum parts.

TEMPERATURE CONTROLLER — *West Instrument Corp, 525 N Noble St, Chicago 22, Ill.* Control is accomplished by plugging portable device into standard electric supply and plugging unit to be controlled into instrument. Two power outlets enable control of blowers, and agitators as well as temperature. Dual ranges are 50 to 500 and 0 to 2000 F.

PREHEAT TIMER—*Vocaline Co of America, 59 Coulter St, Old Saybrook, Conn.* Loads up to 1650 watts can be controlled by this 20-hr timer. Model 2T-20.

THERMOCOUPLE—*Claud S Gordon Co, 3000 S Wallace St, Chicago 16, Ill.* Designed for compactness; withstands 900 F in continuous service. Friction-lock cap is removed by ¼ turn.

NUT-TORQUEING MACHINE — *Hautau Engineering Co, 721 Wanda, Ferndale 20, Mich.* Assembly machines use hydraulically powered multiple spindles to tighten nut or bolt to given torque specification. Torque capacities are from 35 to 120,000 in.-lb. Torque specifications can be held within 2% tolerance, elongation within 0.0004 in.



STATIC PRESSURE—*The Henry G Dietz Co, 12-16 Astoria Blvd, Long Island City 2, NY.* For circuits that must be controlled from exhaust side of fan and shut down in event of failure. Silicon-impregnated glass-cloth diaphragm for operation over wide temperature range. Cat. 101P.

STATIC PRESSURE CONTROL — *Henry G Dietz Co, 12-16 Astoria Blvd, Long Island City 2, NY.* For application on very low pressures; also has safety switch to indicate airflow in electronic equipment. Set to operate with from 0.3- to 20-in. water pressure with differential of 10%.

RADIATION DETECTOR — *Consolidated Engineering Corp, 300 N Sierra Madre Villa, Pasadena 15, Calif.* Pocket-size unit requires no battery; direct-reading scale indicates Gamma and X-ray intensity. With stopwatch and chart instrument can be used as radiation rate-meter. Gamatek.

HYDRAULIC SCALES — *The A H Emery Co, New Canaan, Conn.* Sizes up to 50 tons; said to be accurate within 0.25% of scale. Indicator is mounted directly on hydraulic force-measuring cell.

CYCLE TIMER—*G C Wilson & Co, 2 North Passaic Ave, Chatham, NJ.* For regulation of automatic machinery or laboratory testing. On-cycles range from 0.2 to 200 sec and off-cycles from 0.1 sec to 1 min. Operates on standard supply.

TEMPERATURE-INDICATING — *Tempil Corp, 11 W 25th St, New York 10, NY.* Now available in stick, laquer, and pellet form for 413, 425, 438, 463, 475, and 488 F to complete line ranging from 113 to 525 F in 12- or 13-degree steps. Protective coating has been developed for application where Tempilaq is likely to come in contact with water, oil, or grease.

ENGINE HOUR METER—*Towmotor Corp, Cleveland, Ohio.* For Towmotor lift trucks. Permits recording of all phases of operation. Reads to 10,000 hr.

INDICATING CONTROLLER — *Barber-Colman Co, Wheelco Instruments Div, Rockford, Ill.* Electronic unit incorporates Capaciline which anticipates approach and departure of temperatures cased by heat transfer lags. Model 221C.

MONITORING UNIT — *Alden Electronic and Impulse Recording Equipment Co, Westboro, Mass.* Prints and stores tape record of two separate data traces plus timing trace; can be applied to any on-off phenomena. Tape drive is furnished in varying speeds; action separated by as little as 1/6 sec can be positively recorded.

OVERLOAD INDICATOR—*Westinghouse Electric Corp, PO Box 2099, Pittsburgh 30, Pa.* Logs overload performance on Westinghouse conventional distribution transformers utilizing a bimetallic thermostat embedded in the winding to indicate copper temperature. Type PL.

WEIGHT RECORDER — *Howe Scale Co, Rutland, Vt.* Built-in as integral part of Howe Tape-Drive dial head. Touch of pushbar prints weight in 1 sec. Accuracy is 0.1% of dial chart capacity.

INDICATOR POINT—*Robert Marks Co, 47 Goddard St, Providence, RI.* Boron carbide; a hardness of 2760. Points are tipped with cap 0.070 or 0.125 in. allowing points to be refinished.

AMMETER—*Columbus Products Corp, 1010 Saw Mill River Road, Yonkers, NY.* Extremely sensitive removable and replaceable cartridge gives accuracy of ¼%. Can be used directly in vacuum tube and transistor circuits.

TOOL-LOAD METER—*Detroit Milling Cutter Co, 28625 Grand River, Farmington, Mich.* Works on ammeter principle to reflect motor capacity and percentage overloads. Overload setting is determined by recording reading when tool is dull. Can be set for any motor from 1 to 50 hp.

SPECIFIC GRAVITY — *The Ohmart Corp, 2347 Ferguson Rd, Cincinnati 38, Ohio.* Instrument uses radioactivity to measure specific gravity of liquids or granular materials flowing through pipelines. Measurements are made at operating temperature and pressure, generally with no direct contact with material. Variation in specific gravity is measured over range from 0 to 0.500 above any minimum value with accuracy of ±0.005 in any range.

DEWPOINT RECORDER — *The Foxboro Co, Foxboro, Mass.* Detects moisture content of gas atmospheres and provides guide to proper gas composition in heat-treating furnaces. Dewcel element measures dewpoint temperature within 1°; second pen records gas ambient temperatures.

MARKER-COUNTER—*The May Engineering Co, 6055 Lankershim Blvd, North Hollywood, Calif.* Counts each item checked and makes audible click. Knob on pencil resets counter to zero.

FORCE-METERING—*The A H Emery Co, New Canaan, Conn.* System allows calibrated linear thrusts up to 50 tons in any direction. Force is exerted by hydraulic jack. Available in four cell sizes and three indicator sizes.

ELECTRONIC TIMER — *Photoswitch Inc, 77 Broadway, Cambridge, Mass.* For intervals from 0.05 sec to 4 min. Four basic types of timing: interval, delayed action, automatic repeat, and programming. Type 30HL1.

FREQUENCY - COUNTER UNITS — *Potter Instrument Co, Inc, 115 Cutter Mill Rd, Great Neck, NY.* Models 820, and 830 are for rapid production test measurements. Models 840, and 850 contain all timing, gating, and switching facilities for wide as possible range, including counting to 1 mc or timing within 10 mu-sec.

COUNTER SET—*Photoswitch, Inc, 77 Broadway, Cambridge 42, Mass.* Permits remote counting at speed of 600 counts per min. Consists of photoelectric control, light source, and electric counter.

TIME INDICATOR—*Vocaline Co of America, Inc, Old Saybrook, Conn.* Operates on standard electrical supply. Model ET-1A counts 99,999 hr by hours; ET-1B counts 9999.9 hr by tenths of hours.

TIME INDICATOR—*Marion Electrical Instrument Co, Manchester, NH.* For panel mounting. Registers in 0.1-hr steps to 9999.9 hr, or hour steps to 99,999 hr. Model HM2ET.

AC HOUR LOG—*Engler Instrument Co, 250 Culver Ave, Jersey City, NJ.* Provides continuous record of operating- and down-time for machines using ac supply.

SPEED MONITOR — *Jones Motrola Corp, Stamford, Conn.* Driven by flexible shaft and gears from any machine shaft. Adjustable max and min speed pointers provide means of controlling speed within limits, to actuate relays to shift gears or operate clutches, etc.

TACHOMETER—*Herman H Sticht Co, 27 Park Place, New York, NY.* Four models: 30-12,000 rpm. 45-18,000, 60-24,000, and 120-48,000. Each unit has five ranges of 7-in. scale length. Incorporates slip-coupling overspeed device. Type UO.

DIAL INDICATOR—*Homestrand, Inc, Larchmont, NY.* Graduated to 0.0005 in. with range of 0.400 in. Uses steel band transmission instead of rack and pinion. Swedish.

INDICATOR HOLDER—*Enco Manufacturing Co, 4520 W Fullerton Ave, Chicago 39, Ill.* Mounts to round surfaces with dia as small as ¾ in. Magnetic pull is 65 lb; three-step rod is 6 in. long; adapter allows 360° swivel.

MAGNETIC HOLDERS—*Cullen Manufacturing Co, Racine, Wis.* For indicators or flood lamps. Exerts 50-lb pull through permanent Alnico magnet.

MAGNETIC HOLDERS—*Lufkin Rule Co, Saginaw, Mich.* Swivel-action post is secured in position with knurled locknut. No. 100 has 50-lb pull, sells for $8; 101 has same pull and extra-fine adjustment feature, sells for $9.50; 150 has 100-lb pull, sells for $16.50.

DIAL INDICATOR—*Homestrand, Inc, Larchmont, NY.* For use with any height gage; gets into ordinarily inaccessible places. Dial is graduated to 0.001 with range of ±0.015 in.

DIAL INDICATOR—*Homestrand, Inc, Larchmont, NY.* Equipped with universal shank and graduated to 0.0001 in. Reads 0-40-0 with half of dial in red. Swedish—Vipp.

LAYOUT PLATE — *Collins Microflat Co, 2326 E 8th St, Los Angeles 21, Calif.* Black granite; accuracy is 0.0002 in. per ft; no clamping edges are provided. These facts result in low cost. Sizes from 12x18 to 36x48 in.

GREY GRANITE PLATES — *Collins Microflat Co, 2326 E 8th St, Los Angeles 21, Calif.* Same accuracies prevail as for black granite plates but cost runs 21% less. Sizes range from 12x18 in. to 48x72 in. in 2- and 4-clamp edge types.

SURFACE PLATE STANDARDS — *Collins Microflat Co, 2326 E 8th St, Los Angeles 21, Calif.* Certificate of accuracy includes graph plotting deviation from true plane in millionths. Optical readings are made by British auto-collimator.

CENTERING HEAD—*Contour Marker Corp, 1843 E Compton Blvd, Compton, Calif.* Does work of protractor, centerhead, center punch, level and scale. Two-pronged aluminum body has 1¾-in. protractor dial fitted with level.

BOX ANGLE — *Challenge Machinery Co, Grand Haven, Michigan.* Designed to incorporate clamping facilities of angle iron, stability and accuracy of box parallel, and perpendicular flat surface of angle plate. Available as 6- or 8-in. cube.

BEVEL PROTRACTOR — *Mercury Supply Co, 10 Fairview, Elmhurst, Ill.* With vernier; features acute angle attachment and detachable base. Gives readings to nearest five minutes from recessed graduation lines. Comes with one 6- and one 12-in. blade.

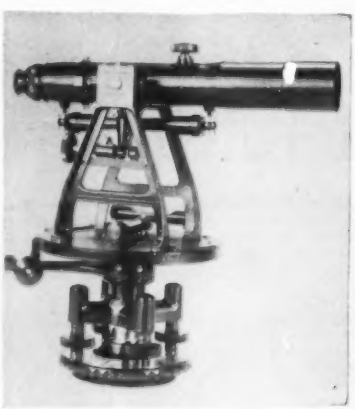
PROFILE TEMPLET—*Toolcraft Mfg Co, 6619 S Dorchester Ave, Chicago 37, Ill.* Composed of fine strips of hard brass, 0.007 in. thick by 0.070 in. wide. Laminations can be slipped to take profile form of casting or forging.

PORTABLE SURFACE PLATE—*The Elkro Co, 736 Albany St, Dayton, Ohio.* Granite plate of four-lip design measures 8x12x2½ in. Overall surface accuracy is reported as 0.000025 in.

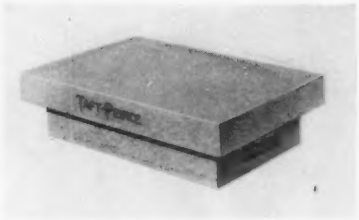
MULTIPLE-UNIT SURFACE PLATE —*The Elkro Co, 736 Albany St, Dayton 8, Ohio.* Two or more granite surface plates on a single stand with provision for aligning plates. Each plate is adjustably supported at three points.

SURFACE PLATES—*Lawley Granite Surface Plate Co, 1412 Packard Bldg, Philadelphia 2, Pa.* Hard, uniform-grained black granite with accuracy to 0.00005 in. Sizes from 12x18x4 to 24x36x6 in.

STEEL BEAM TRAMMELS—*Lufkin Rule Co, Saginaw, Mich.* For layout work, scribing, and measuring. Free-turning knurled grips on top of tram. With 20-in. extension beam, circles up to 72 in. in dia can be scribed with 20-in. trammel. Beams are furnished from 10½ to 20 in. long and priced from $9 to $10.40.



PRECISION TRANSIT—*W & L E Gurley, Troy, NY.* For facilitating jig and fixture alignment. Unit establishes horizontal and vertical planes. Telescope has magnification of 22X. Optoplane.



SURFACE PLATES — *Taft-Peirce Manufacturing Co, Woonsocket, RI.* Blue-white granite; grain angle is 45°. Said to have extremely close grain and low moisture absorption.

PORTABLE SURFACE PLATE—*The Elkro Co, 736 Albany St, Dayton 8, Ohio.* Non-magnetizing and resistant to warp, shock, and abrasion. Guaranteed to retain surface accuracy of 0.00005 in. for 10 years.

BLACK GRANITE — *Rahn Granite Surface Plate Co, 641 N Western Ave, Dayton 7, Ohio.* Surface-angle plate combination consists of 24x36x6-in. plate with two 8x24-in. plates attached to one edge. Flatness tolerance for all plates is 0.00005 in. Perpendicularity tolerance for side plates is 0.0001 in.

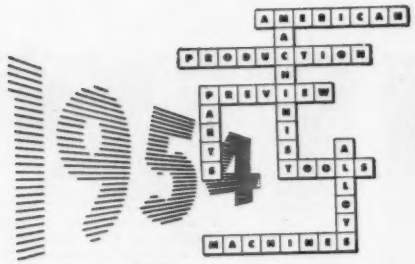
SURFACE PLATES — *Bryant Chucking Grinder Co, Springfield, Vt.* For layout inspection and assembly work. Granite is said to be of exceptionally close-knit composition.

EDGE LOCATOR—*The Medelton Co, 335 E 142nd St, Bronx 54, NY.* Locates spindle over jig-borer work edge within "tenths."

COLLIMATOR—*Mitchell Scientific, 39 MacQueston Parkway North, Mt Vernon, NY.* Sets angles to 30" or, by transference from sine bar, to 5". Price: $180.

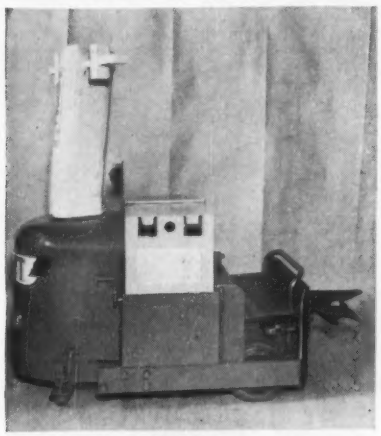
COLLIMATOR — *Safe Flight Instrument Corp, White Plains, NY.* Checks collet and lathe-tool angles within 0.00007 in.; requires no calibration. Can be used on flat as small as 0.004 sq in.; can use reference surface 20 ft away.

COLLIMATOR — *The Perkin-Elmer Corp, Norwalk, Conn.* All components housed in single casting; accuracy greater than 6 sec. Standard eyepiece has focal length of 12 mm giving magnification of 80X.



PLANT SERVICE EQUIPMENT

summarized from descriptions published during 1953



REMOTE - CONTROL — *Barrett-Cravens Co, Chicago 9, Ill.* With 14-oz control box, operator can control specially equipped Barrett truck as far as 150 ft away. Trucks can be operated manually without disconnecting radio control.

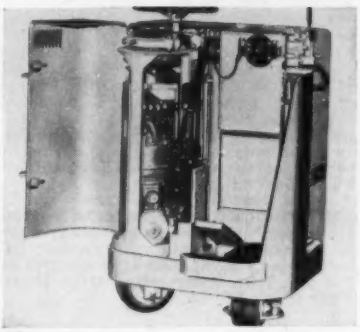
FORK TRUCK — *Mercury Mfg Co, 4044 South Halsted St, Chicago 9, Ill.* 3000-lb cap. with 24-in. load center permits right-angle stacking in 10-ft aisle with load of 48-in. length. Model A3444.

HAND TRUCK-TRAILER — *Mercury Mfg Co, Chicago, Ill.* All-steel, caster-steer unit with 4000-lb capacity. Self couplers at each end for trailer duty. Model A-310-326M.

FORK TRUCK — *Mercury Mfg Co, Chicago, Ill.* Sit-down electric; max fork elevation 130 in.; free lift 58 in.; travel speed 6.5 fpm; right-angle stacks in 10.5-ft aisle with loads 36 in. long. Incorporates Alemite centralized Accumeter lubrication system; valves measure out shot of lubricant accurate to 0.005 in. Yak 430.

WINCH ASSEMBLY—*Mercury Mfg Co, Chicago Ill.* Fitted to the Super-Huskie six-wheel gas tractor; capacity is 15,000 lb.

ELECTRIC TRACTOR — *Mercury Mfg Co, Chicago, Ill.* 2000-lb capacity; automotive steering; four speeds forward and reverse.



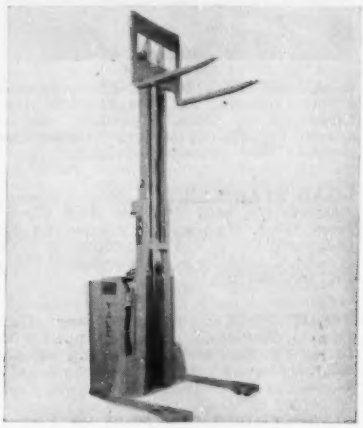
POWER UNIT — *The Raymond Corp, Greene, NY.* Specially designed for ease of maintenance. Elevating control is located on travel switch. Three speeds forward and reverse.

TIERING TRUCK — *The Raymond Corp, Greene, NY.* Electric; can right-angle tier from any 6-ft aisle. Capacity is 2000 lb; forks extend 24 in.; free lift is 51 in.

ELECTRIC TRUCK — *The Raymond Corp, Greene, NY.* Equipped with hydraulic push-pull device for die placement or removal at storage racks or flat-bed presses. Angle winch facilitates loading at inclined press. Forks can be lengthened from 9¼ to 30¼ in. Handles 1-ton dies.

FORK TRUCK — *Raymond .Corp, Greene, NY.* Telescopic; capacity 2000 lb. Elevated height of forks is 132 in., collapsed height 84 in. Forks are 30 in. wide by 42 in. long.

AUTOMATIC COUPLERS—*Towmotor Corp, 1226 E 152nd St, Cleveland 10, Ohio.* Replacement for standard towing eye; open jaw automatically makes connection. Available with hand- or foot-release, or both.



TRUCK—*The Yale & Towne Manufacturing Co, Yale Materials Handling Div, Philadelphia, Pa.* Electric rider straddle truck with 200° steering and 6-ft-aisle operation. Capacity is 2000 or 3000 lb. Three speeds forward and reverse with time delay. Yale Warehouser.

CRANE TRUCK—*The Yale and Towne Manufacturing Co, Philadelphia Div, Philadelphia, Pa.* Universal action; 6000-lb capacity; 34-ft boom. Handles unusual maintenance problems.

STRADDLE TRUCK — *The Yale & Towne Manufacturing Co, 11000 Roselle Blvd, Philadelphia 15, Pa.* Electric. Does right-angle tiering in 5- to 6-ft aisles. Models for 2000 and 3000 lb lift loads 133 in.

TOTE TRUCKS—*Electric Marketeer Mfg Co, Redlands, Calif.* Electric. Three wheel design; half-ton capacity; six speeds.

LIFT TRUCKS — *Towmotor Corp, Cleveland, Ohio.* Equipped with differential which compensates for differences in wheel speeds when turning. Model LT-60.

HOIST PROTECTOR — *Towmotor Corp, 1226 E 152nd St, Cleveland 10, Ohio.* Tubular steel; device telescopes up or down to match movement of lift plunger on fork lift trucks.

LIFT TRUCKS—*Towmotor Corp, 1226 E 152nd St, Cleveland, Ohio.* Models 480-P and LT-60 are now available with dual drive wheels as optional equipment.

HYDRAULIC LIFTS—*Big Joe Manufacturing Co, Chicago, Ill.* Manual or battery operation. Adjustable forks in lengths from 25 to 36 in.

LOAD-REVOLVING UNIT — *Elwell-Parker Electric Co, 4205 St Clair Ave, Cleveland 3, Ohio.* Hydraulic mechanism for hydraulic fork trucks line permits 360° rotation of load.

LOAD STABILIZER — *Elwell-Parker Electric Co, 4205 St Clair Ave, Cleveland, Ohio.* Hydraulically powered attachment for E-P 6000-lb capacity fork trucks. Clamping pressure ranges from 150 to 1350 psi.

FORK TRUCK—*Elwell-Parker Electric Co, Cleveland, Ohio.* Equipped with forks, boom, and die-pulling mechanism. Capacity is 4000 lb, fork length 42 in.

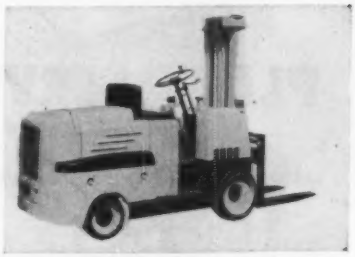
LIFT TRUCK CLUTCH — *Elwell-Parker Electric Co, Cleveland 3, Ohio.* Electro-magnetic drive unit replaces mechanical clutch in lift truck model GF30TD. Truck is gasoline-powered; has 4000-lb capacity.

ELECTRIC FORK TRUCK—*Elwell-Parker Electric Co, Cleveland 3, Ohio.* Stand-up type. Short wheelbase and single-wheel caster type steering. Rated capacity is 2000 lb at 15 in. Model F38T.

STRADDLE STACKER—*Lift Trucks, Inc, Cincinnati, Ohio.* 2000-lb capacity; handles pallets, skids, dies, and drums; stacks in 5-ft aisle. Model HHL.

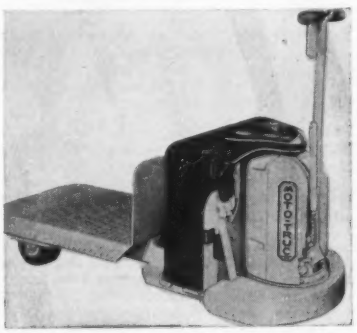
LIFT TRUCKS—*Gerlinger Carrier Co, Dallas, Ore.* Wheelbase is 106 in.; turning radius 146 in.; capacities 4, 5, 6, and 7½ tons. Power steering.

LIFT TRUCKS—*Lift Trucks, Inc, Cincinnati, Ohio.* Hydroelectric Models KT and KHL for use in combination. KT pulls trailers to storage area; KHL lifts palletized loads and stacks them.



LIFT TRUCKS—*The Buda Co, Harvey, Ill.* Gasoline and diesel models are rated at 7500 lb and have lift heights of 72, 84, 108, and 114 in. Rear, top, and side panels are easily removed. Features single-lever full-range gearshift, automotive-type steering, and hydraulic brakes. Model FT 75-24 (gasoline); FTD 75-25 (diesel).

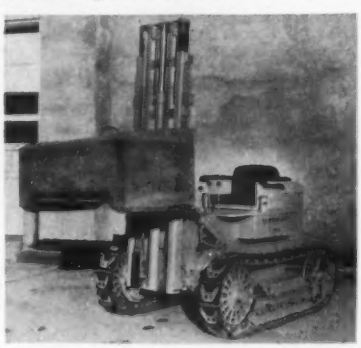
LIFT TRUCKS—*The Buda Co, Harvey, Ill.* Diesel or gasoline powered; 5000-lb capacity at 24-in. load center; lift heights of 72, 84, 108, 114 or 120 in. Turn in 71-in. intersecting aisle. Model FTD 50-24; FT 50-24.



ELECTRIC TRUCK—*The Moto-Truc Co, 1974 E 59th St, Cleveland 3, Ohio.* Redesign of "walkie" line for easier maintenance. Time delay switch eliminates possibility of starting truck in high speed.

TRACTOR—*The Moto-Truc Co. 1974 E 59th St, Cleveland 3, Ohio.* Combination design permits walking tractor or riding it. Max speed of either 3½ or 4½ mph.

TRACTOR—*The Moto-Truc Co, 1974 E 59th St, Cleveland, Ohio.* Electro-hydraulic clamp grips all types of units. Drawbar pull is 700 lb.



FORK-LIFT CRAWLER — *American Tractor Corp, Churubusco, Ind.* Powered by 4-cylinder gasoline engine, capacity is 2 or 4000 lb. Operates in mud 6 in. deep; uses rubber track shoes for inside operation. Terra-Lift.

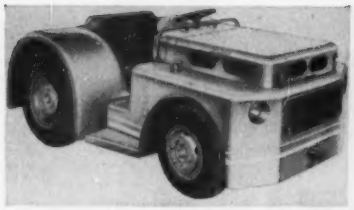
HIGH-LIFT TRUCKS — *Truck-Man Div, Knickerbocker Co, Jackson, Mich.* Model D-15 has 1500-lb capacity and weighs 1700 lb. Lift is 84 in. Model DS-20 has capacity of 2000 lb, weighs 1300 lb. Power is provided by aircooled engine.

POWER LIFT — *Knickerbocker Co, Truck-Man Div, Jackson, Mich.* Skid and pallet low-lift trucks now have automatic hydraulic power lift. Hydraulic pump transmits pressure to 1000 psi through 360° swivel elbow fitting.

FORK LIFT—*Automatic Transportation Co, 149 W 87th St, Chicago, Ill.* Electric; 1 to 4000-lb capacity. Lift is 19¼ in. before overall height begins to increase; full telescopic lift height is 132 in. Four speeds forward and reverse.

TRUCK ATTACHMENT—*Hyster Co, 2902 N E Clackamas St, Portland 8, Ore.* Load-grab attachment now available as load-grab side-shift and remote-control fork positioner.

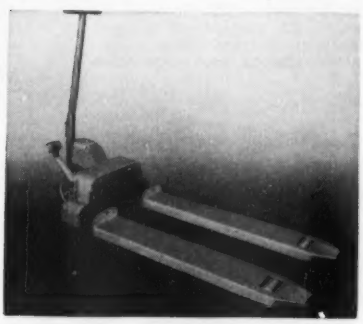
FORK LIFT TRUCKS — *Hyster Co, Portland, Oregon.* Water-cooled industrial engine models YC-40 has 4000-lb capacity; UC-30, 3000 lb. Both have turning radius of 75 in., free lift of 30 in.



TOWING TRACTOR — *Industrial Truck Div, Clark Equipment Co, Battle Creek, Mich.* Drawbar rating of 12,000 lb; powered by 6-cylinder Chrysler engine; equipped with fluid coupling.

TILTING FORK STACKER — *Clark Equipment Co, Buchanan, Mich.* Telescopic with 64- or 49-in. free lift. Capacities of 1500, 2000, 2500, and 3000 lb.

3-SPEED TRANSMISSION — *Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* For friction-clutch model of Yardlift-60 fork truck. Ratios between 1, 2, and 3 gears at changing speeds are less than with two-speed transmission.



LIFT TRUCK—*Rack Hydraulic Equipment Corp, Connellsville, Pa.* Hydraulic truck features interchangeable and adjustable forks. Five standard fork lengths are 30, 36, 42, 48, and 60 in. Fork width may be adjusted from 25 to 27 in. Price: $350.

LIFT TRUCK DEVICE — *Salem-Brosius, Inc, 248 Fourth Ave, Pittsburgh 22, Pa.* Converts standard lift truck into forging manipulator by adding unit using truck hydraulic power. Counterweights move back center of gravity. 500- or 1500-lb capacity. Manipulet.

CATALYTIC EXHAUSTS—*Oxy-Catalyst, Inc, Wayne, Pa.* Replace mufflers on unleaded-gasoline fork lift trucks. Said to oxidize 95% of carbon monoxide and hydrocarbons in exhaust.

MUFFLER—*Oxy-Catalyst, Inc, Wayne, Pa.* Removes harmful vapors from exhaust of non-leaded-gasoline engines.

HAND TRUCK—*Kalamazoo Manufacturing Co, Kalamazoo, Mich.* Used where heavy units cannot operate. Driver rides on pedal platform; max speed 9 mph forward, 7 reverse; turns in 68-in. radius. Six models handle loads to 800 lb. Xpediter.

LIFT TRUCK—*Market Forge Company, 27 Garvey St, Everett 49, Mass.* Interchangeable hydraulic and mechanical features; semi-steel, multi-ribbed wheels. Available in capacities of 3000, 5000, and 10,000 lb.

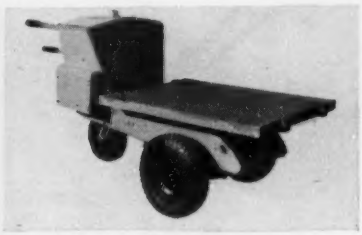
CRANE TRUCK—*Materials Handling Division, Market Forge Co, Everett, Mass.* Capacity is 2000 lb; height, 68 in. Hook is 60 in. high when raised and 10 in. high when lowered. It projects 24 in. over either side of truck. Boom has angular travel of over 180°.

TRUCK TRAILER SYSTEM—*Market Forge Co, Everett 49, Mass.* Integrated fork truck-tractor-trailer system is derived from modified standard items.

HAND TRUCK—*The Rapids-Standard Co, Inc, 342 Rapistan Bldg, Grand Rapids, Mich.* Single or double curved handles for convenient grasping and balancing. Handles loads to 500 lb; is equipped with step-climber.

TORQUE CONVERTER — *Torcon Corp, 493 East Fifth St, Ashtabula, Ohio.* Now used in FT series of Buda fork lift trucks. Single-stage, three-element unit combines hydraulic converter and coupling.

FORK-LIFT TRUCK—*Mobilift Corp, 409 S W 13th Ave, Portland 5, Ore.* 4000-lb capacity unit is powered by Chrysler 6-cylinder 65-hp engine and Gyrol fluid coupling is used in conjunction with multiple-lift oil-immersed clutch and constant-mesh transmission. There is no clutch pedal and no gears to shift. Turning radius is 80 in. Hoisting is accomplished by displacement-type hydraulic cylinder.



POWERED WHEELBARROW — *The Prime-Mover Co, Muscatine, Iowa.* Capacity is ¾ tons, width is 32 in. Flat-bed platform is interchangeable with 10-cu-ft bucket.

LIFT-TRUCK CONVERTER — *Koehring Co, Milwaukee 16, Wis.* 1500-lb lift truck resulted from adding power-driven attachment to Moto-Bug. Rated capacity is 1000 lb at 15 in.

HYDRAULIC SYSTEM—*Allied Manufacturing & Sales Co, 201 N Wells St, Chicago, Ill.* Multiplies lifting speed of Grand industrial hand trucks. Interchangeable with all Grand manually operated hydraulic units.

CARRIERS AND STACKERS — *American Matling Corp, Importers, Detroit 28, Mich.* Transporters are hand- or gasoline-powered, 22 or 27 in. wide, capacities 1000 to 3000 lb. Straddle-type stackers with 4½- or 9-ft lift, gasoline- or ac-powered have from 1- to 2000-lb capacity.

LIFT TRUCK — *Safeway Industrial Equipment Corp, 184 North Franklin St, Chicago, Ill.* Rating is 1250 lb; lifting height 68, 80, or 100 in. Electronic switch cuts off power at max height.

HAND TRUCK — *Automatic Bending Co, Harvey, Ill.* Two aluminum rocker shoes support load while moving up or down a step. E-Z Climb.

HAND TRUCK—*Magline Inc, Pinconning, Mich.* Magnesium hand truck with retractable third wheel. Nose unit extends beyond wheels on either side.

MAGNESIUM HAND TRUCK — *Magnesium Company of America, East Chicago, Ind.* Weighs 18 lb; has 500-lb capacity.

INDUSTRIAL ENGINE—*Ford Motor Co, Tractor and Industrial Engine Div, Dearborn, Mich.* 4-cylinder, overhead-valve engine develops 45 bhp at 2400 rpm. Designed for max efficiency and economy.

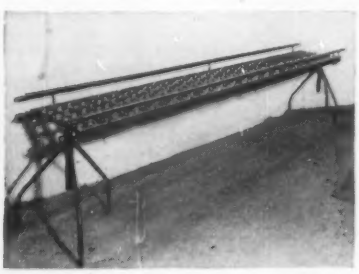
FLOOR TRUCK — *All Steel Welded Truck Co, Rockford, Ill.* Made with two arc-welded steel frames without bolts. Tilt and non-tilt models have capacities to 7000 lb.

CANTILEVER CARRIER—*The Cleveland Crane and Engineering Co, Wickliffe, Ohio.* Overhead carrier has cantilever arrangement permitting unit to handle loads beyond end of crane. Hoist has 1500-lb capacity; reaches out as much as 25½ in. beyond end of crane.

HOIST—*Harnischfeger Corp, 4400 W National Ave, Milwaukee, Wis.* Electric hoist with one-hand rope control. Lift capacities are 500 or 1000 lb, rates 25 and 13 fpm.

TROLLEY CONVEYOR — *Mathews Conveyor Co, Elwood City, Pa.* Wheels made with steel or felt seals. Balls are chrome-steel in pressed-steel cage. Loadstar 4207.

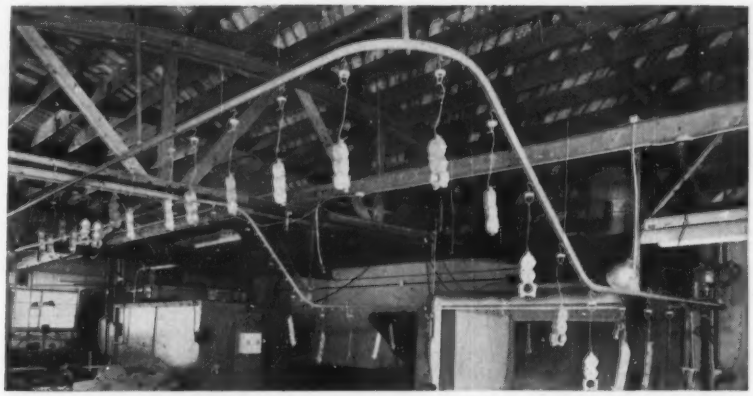
CONVEYOR CHAIN—*Jervis B Webb Co, Detroit, Mich.* 2½-in.-pitch drop-forged conveyor chain has ultimate strength of 37,500 lb. It is flexible in four directions.



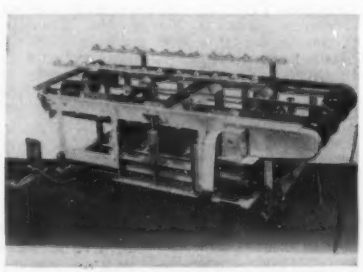
GRAVITY WHEEL CONVEYORS — *Sage Equipment Co, 32 Essex St, Buffalo 13, NY.* Straight, curved, and gated sections, switches, adjustable height-stands, portable trucks meet any layout. 6 to 36 wheels per ft.

WHEEL CONVEYORS—*Sage Equipment Co, 32 Essex St, Buffalo 13, NY.* Conveyors have guard rails adjustable to 5-in. height and are made in standard widths of 12, 14, 18, and 24 in. with 6 to 36 wheels per ft.

ALUMINUM CONVEYOR—*The Rapids Standard Co, Grand Rapids, Mich.* Made in 10- and 16-in. widths with five lengths from 11 to 21 ft. Redesign has increased load capacity, belt-pitch adjustment, and costs less.



CABLE CONVEYOR SYSTEM — *Cable-Link Corp, 20175 John R St, Detroit 3, Mich.* Includes caterpillar drive unit, traction wheel assembly, trolley assembly, and cable-link. Cable-link is plow steel cable with steel buttons swaged on both ends. Three models are available for 2-, 3-, and 4-in. rail.



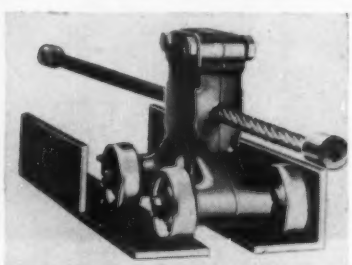
SHEET HANDLING — *Fried Steel Equipment Manufacturing Corp, 528 E 119th St, New York, NY.* Machine handles sheets and strips as cut by shear. Strips may be from 20 to 48 in. wide and up to 6 ft long. Air-operated plungers support sheared ribbon. Coilveyor.

CONVEYOR PULLEY—*R T Sheehan Co, Plymouth, Mich.* Equipped with positive-drive spike-studded pulley at drive end of belt. Designed to specifications for stationary or adjustable-height uplift conveyors to move normal loads at 30 fpm or faster.

CONVEYOR—*Mathews Conveyor Co, Ellwood City, Pa.* For overhead service. Fully enclosed; no wearing parts; curved and straight sections easily installed. Chainveyor.

TROLLEY CONVEYOR — *United States Spring and Bumper Co, Los Angeles, Calif.* Track is slotted steel tubing; conveyor chain consists of vertically mounted load-wheels joined by universal joint to horizontal guide wheels at three-inch intervals. Capacity is 30 lb for loads at 6-in. intervals.

BELT CONVEYOR — *Conveyor Specialty Co, Inc, North Quincy 17, Mass.* Assembled from stock units of various sizes, shapes, and capacities.



CABLE CONVEYOR—*E W Buschman Co, 4401 Clifton Ave, Cincinnati, Ohio.* Four-wheel carriers are attached to ⅜-in. steel cable; pallets and fixtures can be attached to conveyor trolleys. Trolleys are positioned permanently by Bush-Lok bushings swaged to cable under high pressure.

ROLLER CONVEYORS—*Sage Equipment Co, 32 Essex St, Buffalo, NY.* 2¼-in.-dia rollers for use where capacity up to 600 lb per roller is required. Widths from 6 to 36 in.

METAL BELT CONVEYORS — *M-H Standard Co, 513 Communipaw Ave, Jersey City 4, NJ.* Capacity to 16 tons; entire belt runs on protective ball bearings. Horizontal units have widths from 6 to 120 in. and lengths to 200 ft.

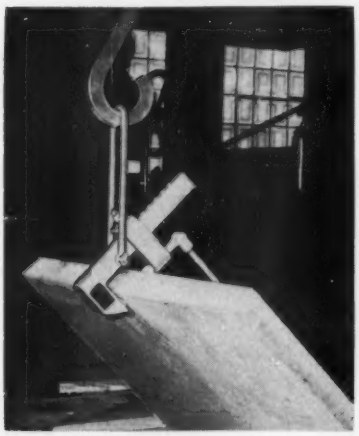
STEEL BELTING—*B F Goodrich Rubber Co, Akron, Ohio.* Carries cartons up or down grades as steep as 55°. Ridged and cross-cut rubber surface provides extra gripping power.

SLAT CONVEYOR—*Sage Equipment Co, 32 Essex St, Buffalo, NY.* Handles hot billets and bulky products. Material is pushed by bars.

CONVEYOR CHAIN — *Arcturus Mfg Corp, 4301 Lincoln Blvd, Venice, Calif.* Uses ball and socket principle; lugs on main links stabilize position of trolley. Said to pull over 60,000 lb. Type 400.

ELECTRIC CRANE—*Cleveland Tramrail Div, The Cleveland Crane & Engineering Co, Wickliffe, Ohio.* Suspends load from triangular support. Said to eliminate practically all lateral and rotational sway.

CRANE EQUIPMENT—*Coles Cranes, Inc, PO Box 942, Joliet, Ill.* Gasoline-electric control eliminates need for mechanical clutches and transmission systems, is said to give smoother power and more accurate handling.

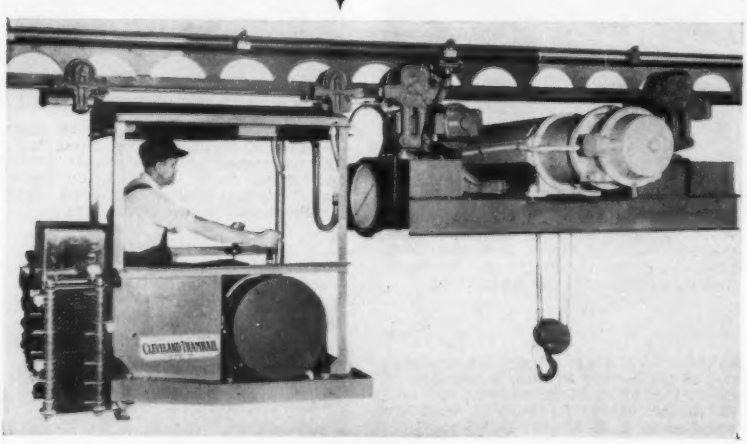


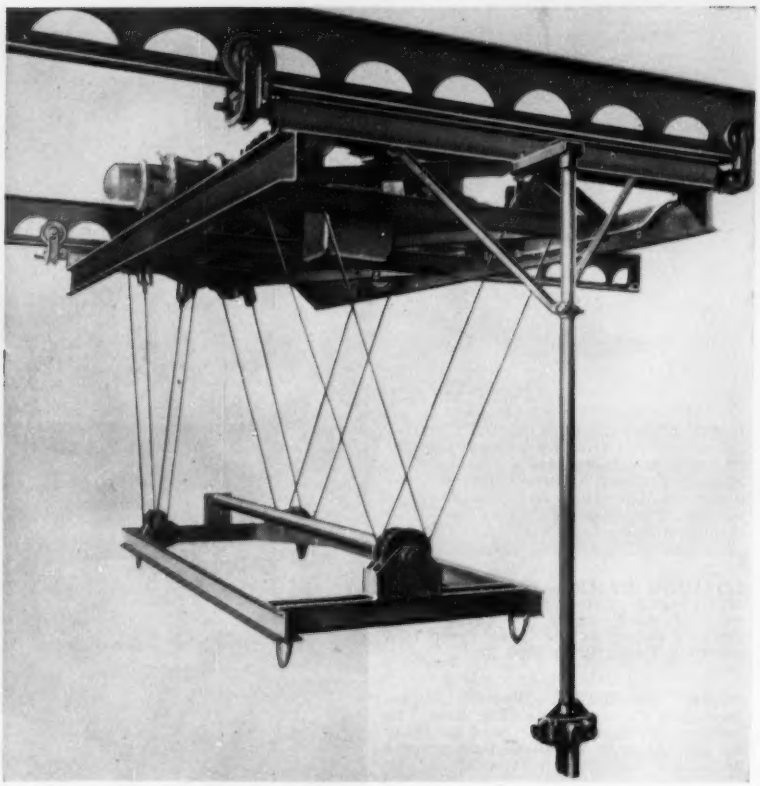
POSITIONER — *James Campbell Smith Co, Inc, Willoughby, Ohio.* For lifting plates, castings, and heavy machinery; combines wedge, screw, and toggle. Long shackle allows 360° turn. Two models have jaw capacity of 0 to 2 and 1 to 8 in. Load capacity is 2 ton.

STACKER CRANE — *Whiting Corp, Harvey, Ill.* Combines functions of fork lifts and overhead crane suspension; expedites handling of drums, dies, and motors. Crane motion may be hand-powered or motor-driven.

CRANE—*The Thew Shovel Co, Lorain, Ohio.* 30-ton capacity; equipped with 100-ft boom to which can be added 25-ft extension. Model SP-524.

TRAMRAIL CARRIER — *Cleveland Tramrail Div, The Cleveland Crane and Engineering Co, Wickliffe, Ohio.* Built-in hydraulic cell scale weighs loads. Travel speed 300 fpm; hoist speed 38 fpm; lift 36 ft; capacity 3 tons.





FLOOR CRANE — *Ruger Equipment Inc, Uhrichsville, Ohio.* Portable hydraulic crane with variable speed pump. Incorporates telescoping boom. Capacities of 1, 2, or 3 tons. Model HP 18B.

SPUR GEAR HOIST — *Coffing Hoist Co, Danville, Ill.* New models include 15 sizes of single- and multiple-chain hoists with capacities from ¼ to 25 tons. Also Clevis-connected, low-head room, and army-type hoists.

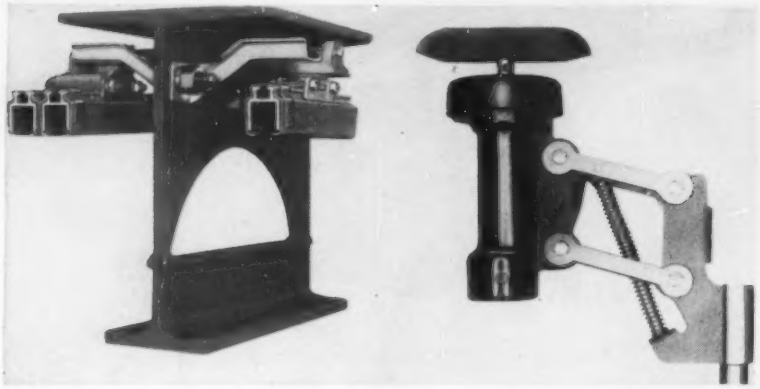
CRANE SCALE—*A H Emery Co, New Canaan, Conn.* Capacities from 1000 to 10,000 lb. Large top U-bolt and 360° swivel. Accuracy guaranteed to 0.2%.

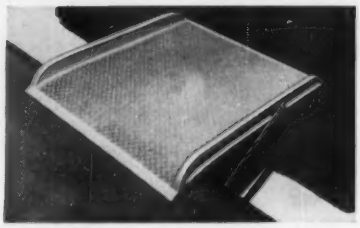
AIR HOIST — *Aro Equipment Corp, Bryan, Ohio.* Weighs 27.5 lb; has capacity to lift 1000 lb at any rate from 0 to 40 fpm. Vane-type motor allows load to be lowered under control at 100 fpm. Standard lift is 8 ft.

CRANE SCALE—*Detecto Scales, Inc, Brooklyn, NY.* Fixed-center construction prevents misalignment of parts. Models for high-ceiling and low-headroom operation.

CRANE LOAD SCALES — *Streeter-Amet Co, 4101 Ravenswood Ave, Chicago 13, Ill.* Electronic; capacities to 10 tons per hook. Weight may be recorded remotely.

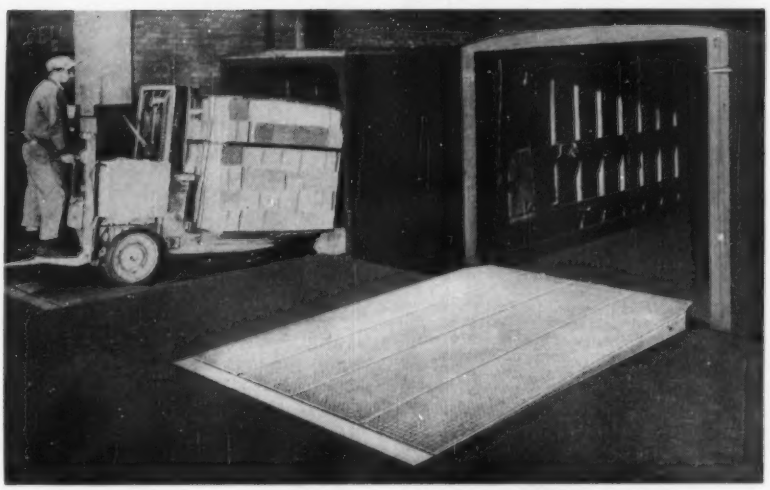
PLANT SERVICE EQUIPMENT—misc materials handling





LOADING DOCK—*Magline, Inc, Pinconning, Mich.* Magnesium loading boards crowned to compensate for height differences between truck and dock. Capacity is 1000 or 2000 lb per axle.

INSULATED CRANE CONDUCTOR—*Cleveland Tramrail Div, The Cleveland Crane & Engineering Co, Wickliffe, O.* Insulated shield covers conductor for overhead cranes and railways. Protects against fire and accidental contact with conductor bar.



LOADING RAMP — *Rotary Lift Co, Memphis 8, Tenn.* Becomes integral part of dock when not being used. Built-in safety device locks ramp into position. Capacity is 2000 lb.

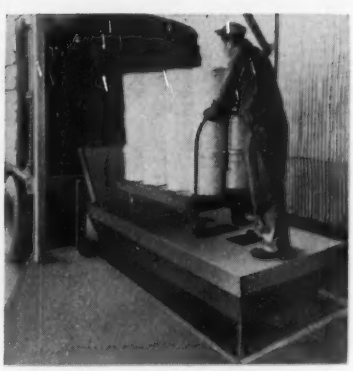
SHEET HANDLER—*Western Manufacturing Co, Arkansas City, Kan.* For vertical storage; can be used portably or permanently installed. Unit weighs 11 lb and has 2500-lb capacity.

TRUCK HEIGHT ADJUSTER—*Rowe Methods, Inc, 2534 Detroit Ave, Cleveland, Ohio.* Raises or lowers carriers to dock height. Has 40,000-lb capacity; operates by pushbutton.

MAGNESIUM RAMP — *Magnesium Company of America, East Chicago 19, Ill.* 30 ft long; for loading freight cars where no loading dock facilities exist; capacity 6000 to 16,000 lb.

HEAVY-DUTY DOLLY — *Crescent Metal Products, 1891 St Clair Ave, Cleveland, Ohio.* Fitted with guards to protect casters; platform is magnesium, aluminum, or hardwood.

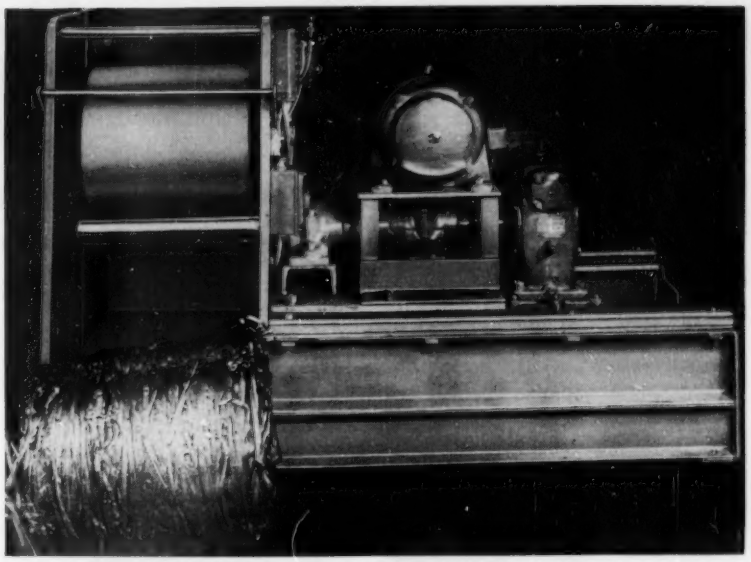
SERVICE TABLES — *Pucel Enterprises, Inc, 3746 Kelley Ave, Cleveland, Ohio.* For use alongside drillpresses and other machines for handling small parts. Eight models, with two or three shelves, capacity of 250 lb per shelf.

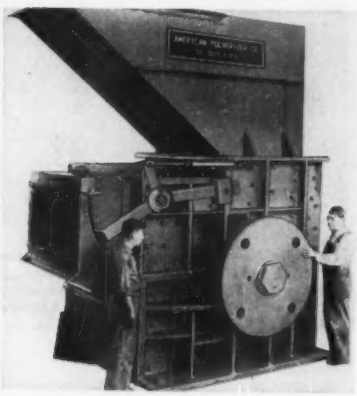


LOADING PLATFORM—*Field Engineering Co, 66 Foote Ave, Jamestown, NY.* Automatically raises or lowers load from dock to truck or trailer floor. Hydraulically powered with 6000-lb capacity and 30-in. lift.

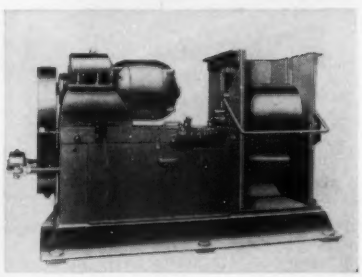
LOADING RAMP—*Penco Engineering Co, 25 California St, San Francisco 11, Calif.* Portable; 60 in. wide at one end, 84 in. at other. 52 models with capacities of 3, 6, 8, and 10,000 lb.

LOADING RAMP—*Globe Hoist Co, E Mermaid Lane at Queen St, Philadelphia 18, Pa.* Hydraulic; self leveling. Capacities are 10, 16, and 20,000 lb.





METAL TURNINGS CRUSHER — *American Pulverizer Co, 1267 Macklind Ave, St Louis, Mo.* Working rate is 35 to 50 tons per hr. Flexibility of rolling ring principle used permits rings to pass over heavy tramp metal without damage. Rings are reversible.

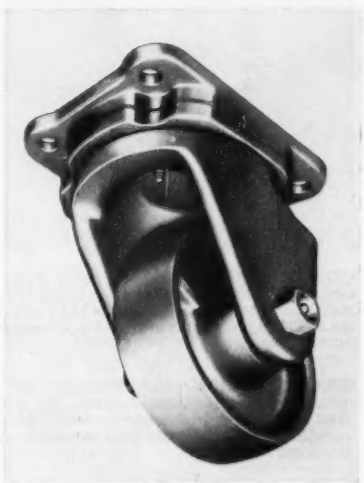


SCRAP BUNDLER — *McLanahan & Stone Corp, Hollidaysburg, Pa.* Forms stringy scrap into compact cylinder around revolving spindle; air pressure discharges cylinder. Model 18 forms roll 18x18; model 24 forms roll 24x24 in.

SCRAP BALER—*Phillips Mine & Mill Co, 2322 Jane St, Pittsburgh 3, Pa.* Handles stringy scrap; forms cylindrical bale 28 in. in dia and 22 in. in length, weighing from 200 to 700 lb. Hydraulic device withdraws mandrel from bale.

STEEL FRAME COMPONENTS — *Ainsworth Manufacturing Corp, Detroit 7, Michigan.* Steel frames of varied shapes can be assembled from three basic units; channel frames, spring T-bolts, and fittings. Mult-A-Frame.

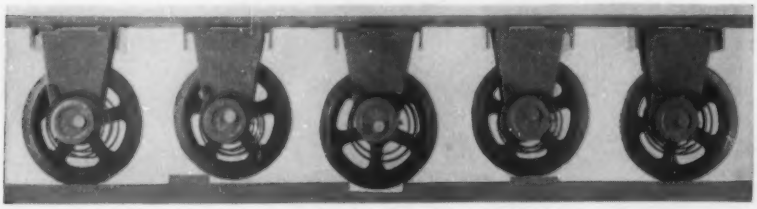
CASTERS, WHEELS—*All Steel Welded Truck Co, Rockford, Ill.* Made of steel; wide range of capacities with sealed swivels and bearings.



SWIVEL CASTER—*Lansing Co, Lansing, Mich.* Eliminates bolt failure by replacing bolt with swivel plate floating within bearing assembly.

STEEL WHEELS — *Goddeyne Wheel Products, Bay City, Mich.* Made in sizes of 6, 8, 10, and 12 in. Ball or oilite sleeve bearings; semi-pneumatic or solid rubber tires.

SEALED BEARING — *Bassick Co, Bridgeport 2, Conn.* For casters and wheels; can be regreased through standard Alemite pressure fittings.

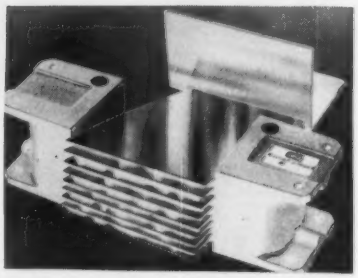


SWINGING HUB CASTER—*Standard Manufacturing Co, Mt Airy, NC.* Suspended on dual springs to eliminate vibration from material handling on rough floors.

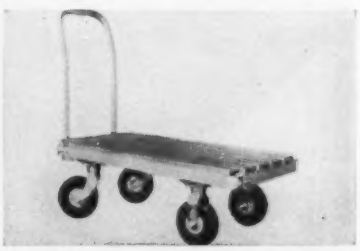
SIDE SHIFTER—*Lewis-Shepard, Dept R-22, Watertown, Mass.* Permanent attachment for Spacemaster electric fork truck. Loads can be shifted 4 in. to either side; all controls are from cab.

DUMPER — *Colson Equipment and Supply Co, Los Angeles, Calif.* Portable elevator lifts, upends, and dumps 100 loads of material per hr. Capacity is 1500 lb.

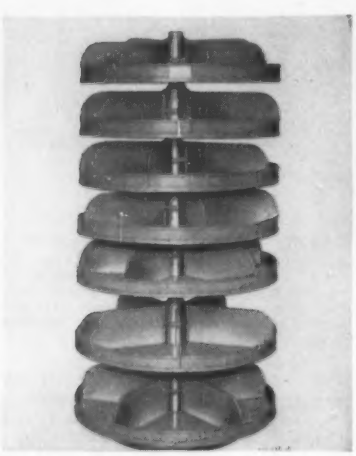
TOTE BOXES—*Randolph Metal Products Co, 3843 W 43rd St, Chicago, Ill.* Hinged rail eliminates loose bails; scalloped edges allow sliding boxes off each other; units take 1200-lb pressure without distortion.



SHEET SEPARATOR—*Material Handling Equipment Co, 141 E 44th St, New York 17, NY.* Floaters magnetize stacked sheets to repel each other. Supplied in pairs 3x3 and 4x4 in.



HANDLING TRUCK—*Tobey Manufacturing Corp, 1221 El Segundo Blvd, El Segundo, Calif.* Aluminum trucks incorporate rounded corners and torsion-flexible bed. Capacities to 6000 lb.



REVOLVING BINS — *Lyon Metal Products, Inc, Aurora, Ill.* Complete storage units with shelves revolving in either direction. Each shelf has five permanent dividers and continuous labelholders. Units have 4 or 7 shelves; dia is 24 in.

CONTAINER—*Pittsburgh Steel Products Co, Pittsburgh, Pa.* Redesign of 1953 Cargotainer with center legs eliminated. May now be stacked vertically.

STACKING BOX—*Bay Products, Inc, 3009 N 16th St, Philadelphia 32, Pa.* Has reinforced corners and drop handles at each end; has continuous stacking rim.

TRAYS—*Jered Engineering & Manufacturing Co, 19800 W Eight Mile Rd, Detroit 35, Mich.* Made from rubber base thermoplastic; stain-, grease-, and shatter-proof.

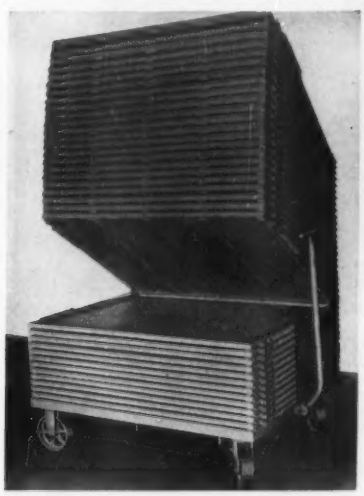
COIL STORAGE RACK—*Equipment Mfg Co, Inc, 21550 Hoover Rd, Detroit 5, Mich.* Removable tray facilitates placement of two rows of small dia coils one above the other. Longitudinal supporting rails are set at 45°.

TRAY—*The Union Metal Manufacturing Co, Canton, Ohio.* For use with fork lift trucks. Steel tray is open at both ends.

STORAGE UNIT—*Akro-Mils, Inc, PO Box 989, Akron 9, Ohio.* Transparent plastic draws make up 128-drawer, 384-compartment cabinet for small parts. Model J-128.

BAR STOCK RACKS—*Fab-Weld Corp, Pickwick & Richmond Sts, Philadelphia 3½, Pa.* Carry bar stock pipe and other mill-length stock, loose or bundled, to loads of 10,000 lb per rack.

SLIDE RACKS—*Stackbin Corp, 1139 Main St, Pawtucket, RI.* Roller-bearing slides allow heavy bins to slide easily. Racks lock together to form storage units of any size, shape, or capacity.

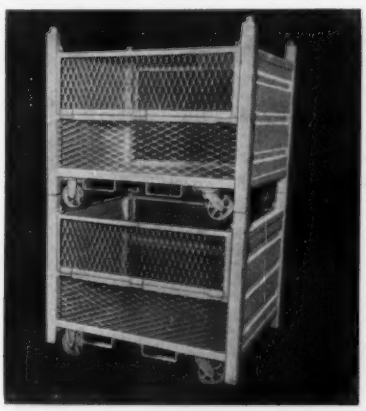


MULTI-TIER TRUCK—*Rack Engineering Co, Connellsville, Pa.* For handling flat material without contact. Each leaf may be locked in semi-up position.

HANDLING UNIT—*Union Steel Products Co, Albion, Mich.* Permits loads to be piled above top rod. Capacities are 2000, 4000, and 6000 lb; folds to 1/5 space when empty.

ENCLOSED CABINETS — *Crescent Metal Products, Inc, 18901 St Clair Ave, Cleveland, Ohio.* Tote boxes form their own shelves when slid into grooves formed by corrugated sidewalls.

SHELF TRUCKS—*Bay Products Inc, 3001 N 16th St, Philadelphia 32, Pa.* Fixed bottom shelf with flange turned up, others reversible. Two casters rigid, two swivel. Height 36½ in.



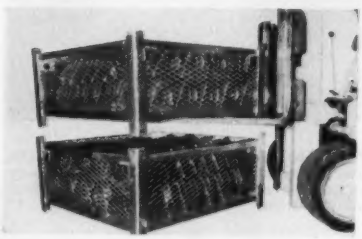
RACK STOCK CARRIER—*Rack Engineering Co, Connellsville, Pa.* One-ton capacity; wire-mesh sides; may be stacked to six high; sides drop down on hinges.

SHELF TRUCKS—*Bay Products Inc, 3001 N 16th St, Philadelphia, Pa.* For stock or tools; 36½ in. high, including casters. Steel shelves have 2-in. flange.

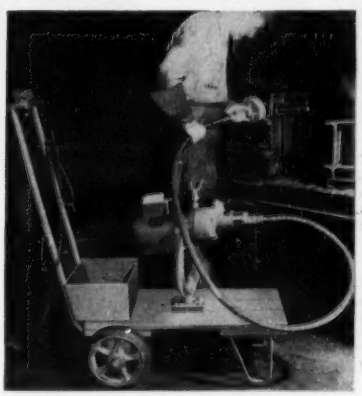
METAL CASES—*Hudson Tool & Die Co, 118 S Fourteenth St, Newark 7, NJ.* Made of aluminum, brass, copper, or steel; sizes from 16x10x7½ to 11/16x 11/16x1-1/16 in.

DRYING RACK—*Palmer-Shile, 16003 Fullerton, Detroit 27, Mich.* For drying or curing sheets or materials or for use where parts must be separated. Shelves can be raised, are held in position by extension springs.

STACKBINS — *Stackbin Corp, 1139 Main St, Pawtucket, RI.* Double-ended to serve operators on two assembly lines.



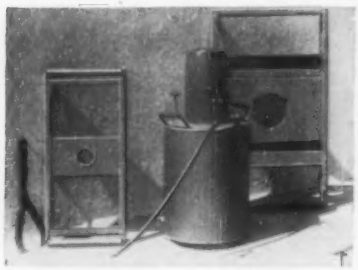
STACKING BOXES—*Morrison Steel Products, Inc, 601 Amherst St, Buffalo, NY.* Capacity to 7000 lb. Units are 50-in. square at top, 49 at bottom, for stacking.



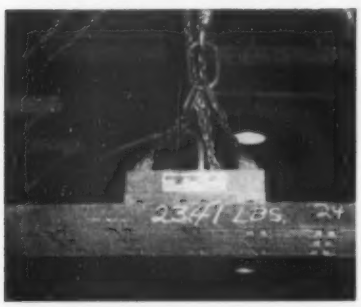
TRUCK MOUNT — *Franklin Balmar Corp, N A Strand Div, Woodberry, Baltimore 11, Md.* For flexible shaft machines; power unit is mounted in yoke providing 360° swivel; hand piece clamps to handle.

TOTE PANS—*G B Lewis Co, Watertown, Wis.* Made of Fiberglas. Sizes are 18x12x8, 14x11x4, and 24x20x10½ in.

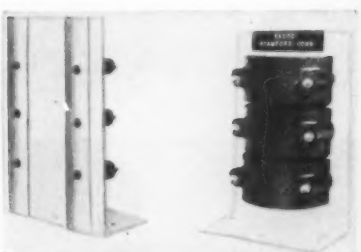
PLANT SERVICE EQUIPMENT—misc materials handling



HYDRAULIC LIFT — *Hamlin-Klock Corp, Pasadena, Calif.* 600-lb capacity; minimum height 33 in.; max lift of 98 in. Unit is portable, sells for $840.00.



LIFTING MAGNET—*O S Walker Co, Inc, Worcester 6, Mass.* Said to employ complete saturation and equable flux distribution. Capacity is 5000 lb.



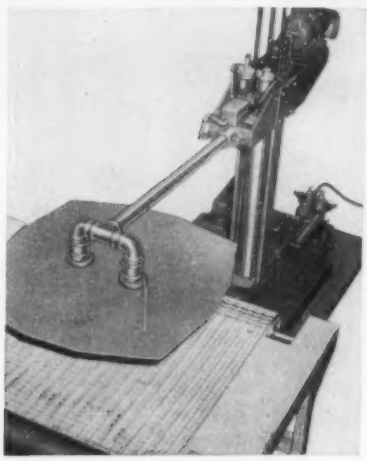
MAGNETIC SHEET SEPARATOR—*The Basco Manufacturing Co, 5 Woodside St, Stamford, Conn.* Four models handle sheets of 20 gage and lighter to 12 gage and heavier.

STACKING BOX—*Equipment Manufacturing, Inc, 21550 Hoover Rd, Detroit 5, Mich.* Sides and bottom are wire fabric to decrease weight and allow for ventilation. Standard model has 4000-lb and 30-cu ft capacity.

DRUM LIFTER — *Palmer-Shile Co, 16018 Fullerton, Detroit, Mich.* Safety barrel grip; all-steel construction; handles open and closed drums.

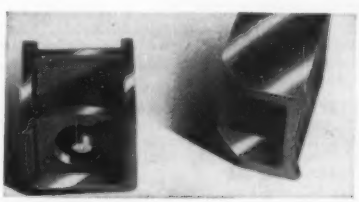
LIFTING SYSTEM—*Allied Mfg and Sales Corp, 201 N Wells St, Chicago 6, Ill.* Hydraulic system to match lifting speed of truck to weight of load. Capacities from 500 to 3000 lb; lifting heights from 36 to 98 in.

PERMANENT MAGNETS — *Dings Magnetic Separator Co, Milwaukee, Wis.* Remove tramp iron from material carried on belts or in ducts.



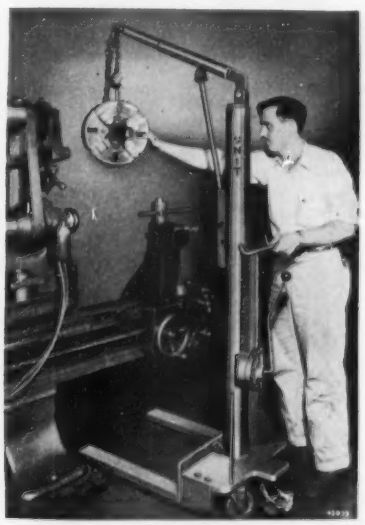
VACUUM LIFT — *Union Tool Corp, Warsaw, Ind.* Self-contained unit handles non-porous metal sheets up to 40x40 in. at rate of 1 to 6 sheets per min. Will pick-up at any level from floor to 36 in. and is adjustable through 180°. Pushbutton control can be located on separate unit. Automatic cycle can be provided.

LIFT UNIT—*Barrett-Cravens Co, 4609 S Western Blvd, Chicago, Ill.* For overhead maintenance. Platform lift is 12 ft 8 in. above floor. Lift-A-Loft.



DIE-HANDLING TOOL—*R H Froom & Co, Los Angeles, Calif.* Developed to provide safer method of handling forming dies during melting process. Two plates are bolted to die and lifting chain is hooked to them.

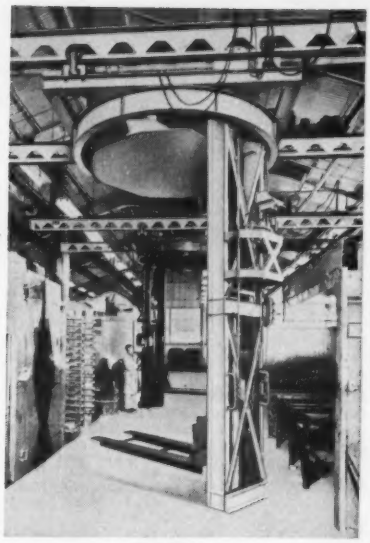
PLATFORM LIFT — *The Rapids Standard Co Inc, Dept VL, 342 Rapistan Bldg, Grand Rapids 2, Mich.* Raises and lowers 800 lb at 15 fpm; Platform is 24x30 in.; electric hoist mechanism is totally enclosed.



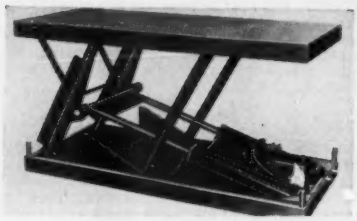
HYDRAULIC LIFTER—*Unit Mfg Co, Dept 101, 1229 Harmon Place, Minneapolis, Minn.* 3-in-1 shop truck handles jobs whether they require boom, forks, or platform. Handles 750-lb loads by hydraulic system.

RACK LIFTER—*Industrial Bench & Equipment Mfg Co, Inc, 98 South St, New Britain, Conn.* Consists of pulley with teeth that grip chain and shaft with one end fitting into hole in fixed support while other end fits into electric drill which supplies lifting power.

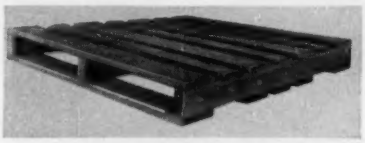
MAGNETIC PARTS ELEVATOR — *Prab Conveyors, Inc, 19875 Mack Ave, Detroit 36, Mich.* Serves two-level conveyor systems and odd-level mechanisms. Alnico magnets at end of elevating arm grip parts to be lifted.



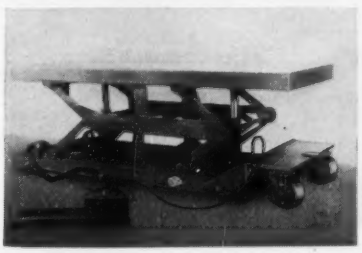
STACKER CRANE — *Whiting Corp, Harvey, Ill.* Lift forks are mounted on mast suspended from overhead crane and rotating from 360°.

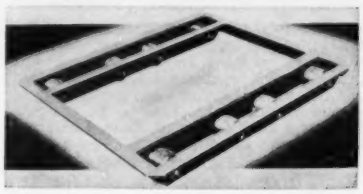


LIFT TABLE—*Beacon Machinery Inc, East St Louis, Ill.* Minimum height is 9 in., max 43 in. Capacities are 4000 and 10,000 lb. Lifting is accomplished by Vickers hydraulic power pack controlled by pedals at end of table.

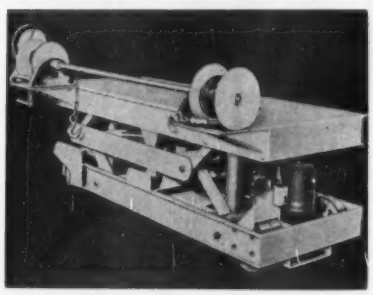


PALLET—*Clinch-Tite Pallet Co, 50 Fairfield St, Boston 16, Mass.* Nails are clinched in holes drilled through the centerline of pallets.





PALLET ROLLERS—*Frank L Robinson Co, Latham Square Bldg, Oakland 12, Calif.* Equalizer design retains parallelism under all conditions. Frame is high-tensile-strength steel, all-welded construction.

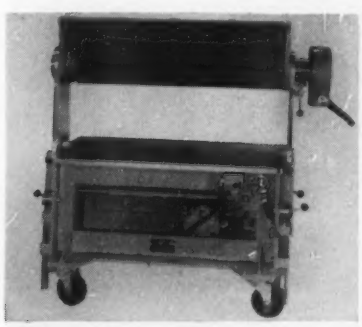


DIE-HANDLING UNIT — *The Raymond Corp, 47108 Madison St, Greene, NY.* Winch and cable arrangement mounts company tables. Gear reduction of 96 to 1 makes manual operation possible for drawing dies weighing up to 5 tons. Winch is mounted on brackets extending beyond sides of table.

DOUBLE-RAM TABLE — *Rack Hydraulic Corp, Connellsville, Pa.* Feeds large sheets to rams, presses, and brakes. Portable unit has 3- to 10-ton capacity and 36x96-in. tabletop. Hydraulically operated by multispeed foot pump.

PALLET DOLLY—*Roll Rite Corp, 801 Jefferson St, Oakland 7, Calif.* Has 24 6-in. wheels to support load. Standard production sizes are 30x40 and 40x48 in.

LIFT HOOK—*Safety Hook Div, E D Bullard Co, 275 Eighth St, San Francisco 3, Calif.* Safety gate locks automatically, requires manual depression of pin to swing open on shank axle. Hooks are drop-forged steel and component parts are cadmium plated.



DIE HANDLER — *Hansford Manufacturing Corp, 1239 University Avenue, Rochester 7, NY.* Portable device for taking apart heavy dies; equipped with motorized attachment to drive upper platen at rate of 16.3 ipm. Can be furnished to match JIC regulations.

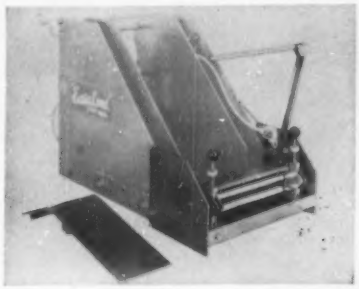
HYDRAULIC TABLE—*Rack Hydraulic Equipment Corp, Connellsville, Pa.* One-ton capacity; 24x35-in. worktable rotates to 360°. Elevation can be adjusted from 28 to 44 in.

SKID RACKS—*American Sales Engineers, Agents for American Metal Products Co, Detroit, Mich.* Fit together without bolting or welding; built to any height desired.

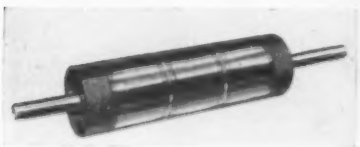
EQUALIZING SLING—*The Caldwell Co, Rockford, Ill.* For use on crane hooks; nine sizes from ¾- to 28-ton capacity. Safety factor of 5:1 at 45° angle has been maintained. Model 52.

UNIVERSAL GRAB — *Palmer-Shile Co, 16019 Fullerton, Detroit, Mich.* Heavy forged-steel hooks have adjustable spread to handle loads from 16 to 48 in. Capacities are 1 and 2000 lb.

PLANT SERVICE EQUIPMENT—misc materials handling

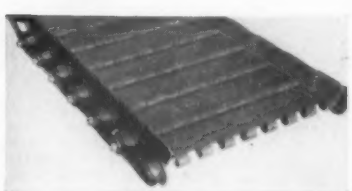


PINCH ROLL ATTACHMENT—*Rowe Machinery & Manufacturing Co, 1506 N Industrial Blvd, Dallas, Texas.* Feeds such difficult materials as thin, thick, oily, laminated, or spring-tempered stock. Available in sizes to fit the 800, 2000, and 3000 series of Easy Load automatic coil cradles.



MAGNETIC PULLEY—*Eriez Manufacturing Co, Erie, Pa.* Claimed to be as strong as units measuring twice its 4-in. dia. For conveying systems where belt thicknesses are ⅛ in. or less and speeds do not exceed 30 rpm. Belt widths from 4 to 24 in.

ROLLER SKID—*Stokvis-Edera & Co, Inc, 95 Madison Ave, NY 16, NY.* Supports up to 80 tons. Widths of 3½, 4, and 5 in.

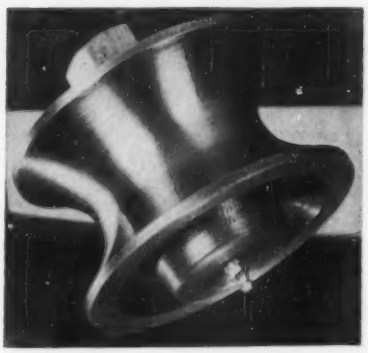


STEEL BELT LINK—*May-Fran Engineering, Clarkstone Rd, Cleveland 12, Ohio.* Component links now incorporate four interlocking flanges on each side of link. Links are solid or perforated.

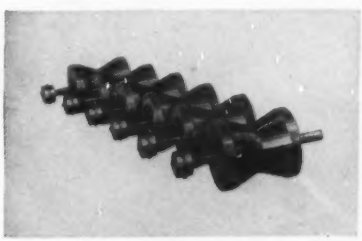
LONG PARTS HANDLING — *Phillips Mine & Mill Supply Co, 2300 Jane St, Pittsburgh, Pa.* Unit for stacking and transporting pipe, angle iron, structural steel, and other long items. Capacity is 4000 lb. Model GC-50.

STEEL FRAMING—*M-H Standard Co, Versabar Div, 515 Communipaw Ave, Jersey City 4, NJ.* For assembling racks; available in channel form in four basic sizes. Tools required are wrench and hacksaw.

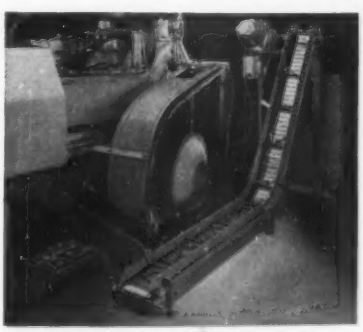
V-LINK BELTING—*Brammer Corp, 684 Broadway, New York 12, NY.* Natural rubber compound increases flexibility of each link. Size symbol is embossed on each rivet head.



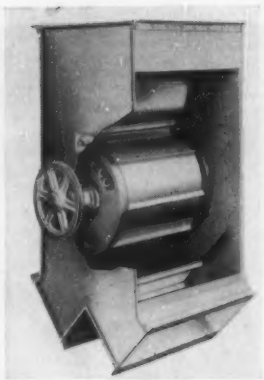
CONVEYOR BELT GUIDE — *Knapp Mills Inc, 23-15 Borden Ave, Long Island City, NY.* Device is termed Guidler—serves as idler as well as guide. Can also be used to control belt within narrow distances of movement. Norwegian.



MAGNETIC ROLLS—*Dings Magnetic Separator Co, Milwaukee, Wis.* For handling pipe, rods, angles, flat sheets, plates, and bars. Concave and straight surfaces.

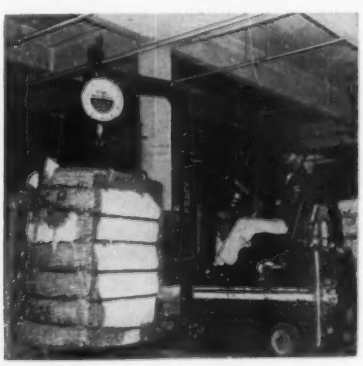


PICK-UP UNIT—*Steel Products Fabricators, 12032 S Emerald Ave, Chicago, Ill.* Conveys parts from machines and loads them in containers.



MAGNETIC DRUM—*Eriez Manufacturing Co, Erie, Pa.* For removing tramp iron and medium fine ferrous contamination automatically from materials conveyed in systems not employing belts.

FURNACE LOADER—*Michigan Crane and Conveyor Co, Detroit 9, Mich.* Meters flow of small pieces to heat treating unit. Basic design is series of reciprocating inclined steps. Capacity ranges from 500 to 4000 lb per hr.



LIFT TRUCK SCALE—*W C Dillion & Co Inc, Box 3008, 14620 Keswick St, Van Nuys, Calif.* Electrical or hydraulic combination swivel arm and scale. Scale can be removed and used separately.

PHOTO MACHINE — *General Photo Products Co, Inc, General Photo Bldg, Chatham, NJ.* Produces dry copies of anything typed, written, printed, or drawn. 60 to 90 copies per hr at cost of 8¢ each for letter-size copy. Automatic model is priced at $325.

DRAFTING BOARD — *The Bradford Bailey Co, PO Box 440, Elizabeth, NJ.* Has rubber desk grips on back to prevent slipping; size 15x19 in. Model 2A. Price:$4.50.

COPY-HOLDING SLIDE — *New Hermes Engraving Machine Corp, 13-19 University Place, New York, NY.* Permits horizontal engraving of letters and numerals in one continuous operation. Usable on any Engravograph with standard ⅝- or 1¼-in. blanks.

TEMPLETS—*New Hermes Engraving Machine Corp, 13-19 University Pl, New York 3, NY.* Master templets of units which remain constant from job to job can be cut with Engravograph. Unit reproduces original design on sheet of transparent plastic.

WHITEPRINTER — *Peck & Harvey, 5650 N Western Ave, Chicago, Ill.* For printing and developing line whiteprints in volume. Printing speed is from ½ to 14 fpm; develops fully at 8 fpm. Handles cut sheet or roll stock up to 42 in. wide.

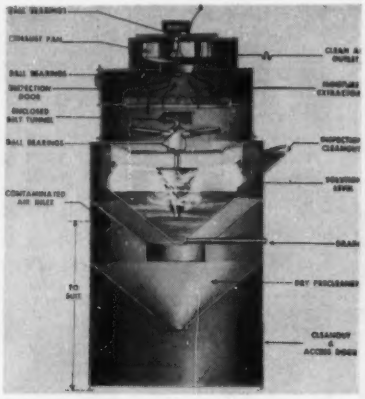
PLANT LAYOUT TEMPLETS — *Repro-Templets, Inc, Oakmont, Pa.* Line includes 10,000 standard machine tools and other pieces of plant equipment printed on acetate film.

DRAFTING TABLE — *Tectonic Services, Inc, 2074 E 36th St, Cleveland, Ohio.* Designed for use with an ordinary chair; top tilts to either side, is 3x6 ft. Price: $79.95.

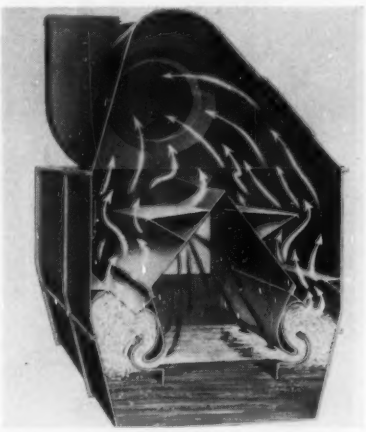
COMPASS—*A Patrick Co, PO Box 28, Westwood, NJ.* 72-in. radius. Steel beam on edge assures parallel disposition. Model with automatic locking lever priced at: $7.50; model which opens by pressing trigger priced at $4.50.

DUCT FAN—*Chelsea Fan & Blower Co, 639 South Ave, Plainfield, NJ.* For temperatures up to 110 F. Sizes 16 to 48 in., 2900 to 37,500 cfm. Type PLFX.

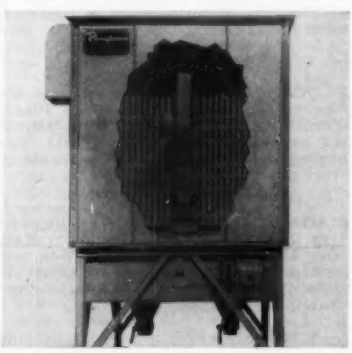
AIR CENTRIFUGE — *Superior Separator Co, Hopkins, Minn.* For plant airflow systems where processes involve grinders, pulverizers, purifiers, and mixes. System blower propels air upward to outlet tube; finer particles are passed through rotor perforations into space.



DUST ELIMINATOR—*Schmieg Industries, Inc, Box 4701, Detroit 34, Mich.* Vertical-rotor, wet type. Cyclonic principle of dust separation and positive high-pressure water action. Capacities range from 500 to 50,000 cfm. One type is used for wet collection and elimination only; other is primary dry and secondary wet collection unit.



DUST COLLECTOR — *American Air Filter Co, Inc, Louisville, Ky.* Hydrostatic precipitator — separates dust from air by means of S-shaped water curtain. Capacities range from 1000 to 48,000 cfm. Design 4, Type N.



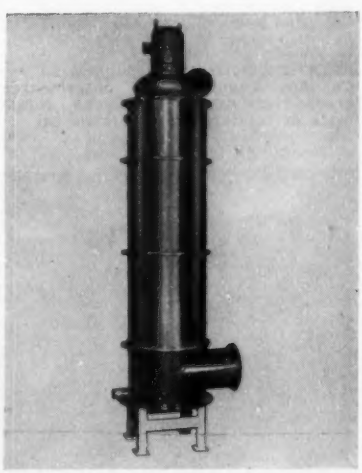
DUST COLLECTOR—*Pangborn Corp, Hagerstown, Maryland.* Uses reverse airflow for continuous cleaning of cloth filters. All moving parts of cleaning mechanism are located on clean air side. Model CH-3.

EXHAUST VENTILATORS — *American Agile Corp, PO Box 168, Bedford, Ohio.* Corrosion-resistant; fabricated from unplasticized polyvinyl chloride. Four sizes range from 250 to 1670 cfm.

SIDE-EXHAUST COLLECTOR—*Torit Manufacturing Co, 280 Walnut St, St. Paul, Minn.* Left-panel exhaust outlet provides recirculation of cleaned air when unit is used beneath bench. Moves 370 cfm with speed of 7500 fpm. No. 66.

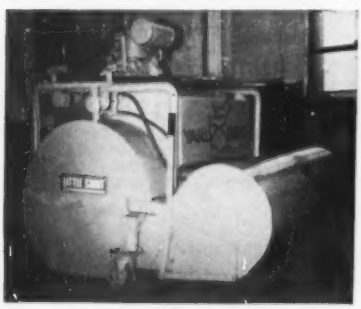
DUST FILTER UNIT—*W W Sly Manufacturing Co, 4700 Train Ave, Cleveland 2, Ohio.* Cleans air by passing it through fabric of cloth filter bags. Traveler moves back and forth across open ends to introduce clean air blast in reverse direction for continuous cleaning. Dynaclone model No. 6-C.

ROOF EXHAUSTER — *Gallaher Co, 4108 Dodge St, Omaha, Neb.* Can be installed without penthouse and extra ductwork; output to 65,000 cfm. Air seal-off develops negative pressure around motor shaft.



FUME WASHING TOWER—*US Stoneware Co, Akron, Ohio.* For general laboratory and industrial use. Fume-laden air drawn into tower is sucked up through intermediate sections filled with Intalox Saddle packing. Rising air, scrubbed by descending water, is discharged from top exhaust. Tower dia is 20 or 30 in.

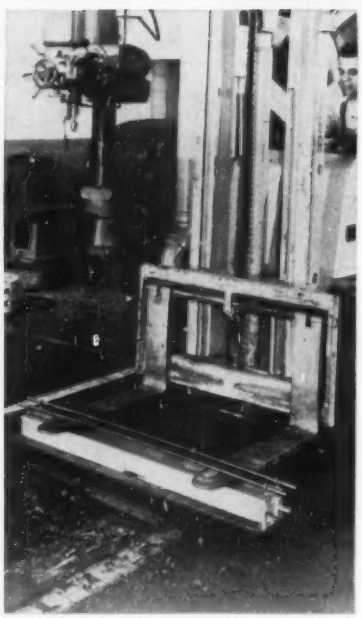
SWEEPER ATTACHMENT — *Parker Sweeper Co, 56 Bechtel Ave, Springfield, Ohio.* 1-hp gasoline engine couples the sweeper by steel arms.



SWEEPER — *Little Giant Products, Inc, Peoria 3, Ill.* Mounts on forks of any standard fork truck. Equipped with built-in 35-gal. sprinkler system.

FLOOR STRIP—*R L Mitchell Rubber Co, Los Angeles, Calif.* Interlocking, grease-resistant 24-in. blocks. Single mats or sections can be made up.

STEEL FLOORING—*Armco Drainage & Metal Products, Inc, Middletown, O.* Suitable for 20-ton floor loads. Slotted plates are hammered lightly into wet cement.



MAGNETIC SWEEPER—*Eriez Manufacturing Co, Erie, Pa.* Can be attached to trailer hitch or adapted for use on lift trucks. Three strengths and four widths; 24, 36, 48, and 60 in.

FLOOR PLATES—*The Challenge Machinery Co, Grand Haven, Mich.* Placed directly on floor; leveled with adjusting screws through top of plate. Furnished as single units up to 54x144 in.

MAGNETIC SWEEPER — *Multifinish Mfg Co, 2114 Monroe, Detroit 7, Mich.* Has 1½-in. clearance under 8-in. circumference housing. Unloaded by stripping off Neoprene Nylon cover. Standard widths to 6 ft.

RESURFACING COMPOUND — *The Monroe Co, 10703 Quebec Ave, Cleveland 6, Ohio.* Plastic; contains cohesive agent forming unusually hard non-skid floor surface. Applies to wood, concrete, brick, or steel.

ABSORBENTS—*Oil-Dri Corp of America, Chicago, Ill.* For industrial floor maintenance. Individual problems are studied by representatives.

PLASTIC FLOOR FINISH—*The Monroe Co, Inc, 10703 Quebec Ave, Cleveland, Ohio.* Forms semi-gloss non-glare finish said to last four times as long as wax. Skid-Not.

HEAT-RESISTANT FLOORING — *Flash-Stone Co, Philadelphia, Pa.* For use where temperatures range to 2000 F; heat disperses through aluminum rod embedded below surface.

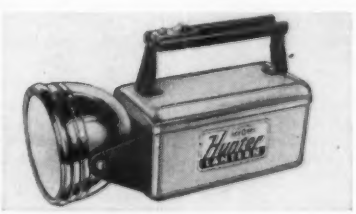
SAFETY GRATING—*Grip-Strut Div, The Globe Co, 4000 S Princeton Ave, Chicago 9, Ill.* Formed from one piece of metal (steel or aluminum) by slitting and folding, rather than expanding, the metal.

FLOORING — *Flash-Stone Co, 3733 Pulaski Ave, Philadelphia 40, Pa.* Steel plates 1-ft square embedded in special concrete. Can be used over old floor.

FLOOR COATING — *United Laboratories, Inc, 16801 Euclid Ave, Cleveland, Ohio.* Bonds dust particles that are actually part of concrete floor. Leaves no surface film. Transvar 266.

LAMP REFLECTOR—*The Jones Metal Products Co, West Lafayette, Ohio.* Screw into standard light socket; 10- and 12-in. dia units are priced at $2.00 and $2.50.

FLOODLIGHT—*Cullen Manufacturing Co, Racine, Wis.* Mounted on extension attached to magnetic base. Model 675. Price: $8.50.



LANTERN — *Ray-O-Vac Co, 212 E Washington Ave, Madison, Wis.* Prefocused and equipped with flasher button. Switch is on top of handle.

LAMP GUARD—*Gets-A-Lite Co, 3865 N Milwaukee Ave, Chicago, Ill.* Designed to prevent fluorescent lamps from falling from their sockets.

MACHINE TOOL LIGHT — *Vimco Manufacturing Co, 109 Brayton St, Buffalo, N.Y.* Oil-proof wrapping; extra-large adjustable arm to resist vibrational movement on such units as punch presses.

POLARIZED WELDING LENS—*Polacoat, Inc, 9808 Conklin Road, Blue Ash, Ohio.* Attachment for welding helmet contains two rotating polarized lens to allow any protection from 6 to 12.

COVER GOGGLES — *Chicago Eye Shield Co, 2300 Warren Blvd, Chicago, Ill.* Fit over regular glasses; wider bearing surfaces eliminate pressure points; 50-mm lenses. Series 548.

SPECTACLES—*Watchemoket Optical Co, 232 W Exchange St, Providence 3, RI.* Plastic templets can be adjusted for exact fit. Lens replacement is accomplished through split joint. Furnished with clear or green safety glass.

WELDING HELMET — *United States Safety Service Co, 1215 McGee St, Kansas City, Mo.* Made of fiber glass; one-piece seamless shell is warp-resistant.

PROTECTIVE LENS—*Eastern Equipment Co, Willow Grove, Pa.* Line includes green for aluminum welding, cobalt blue for furnace work and spatter-resistant lens.

SAFETY GOGGLES—*Pulmosan Safety Equipment Corp, 644 Pacific St, Brooklyn, NY.* Hardened lenses for chipping, grinding, and impact; filter lenses for welding, burning, and cutting; special construction for chemicals.

PLASTIC WELDING HELMETS — *American Optical Co, Southbridge, Mass.* One piece; Fiberglas, reinforced with polyester resin. Four styles.

GOGGLES—*United States Safety Service Co, 1215 McGee, Kansas City 6, Mo.* With plastic or hardened glass lens. One type for chippers and two types for welders.

SAFETY GOGGLE—*Pennsylvania Optical Co, Reading, Pa.* Acetate frame designed to retain lens under heavy impact. Flat, 1.25, 6.00 curve, heat-treated safety lens. Model 707.

HEAD SHIELD—*The Lincoln Electric Co, Cleveland, Ohio.* For arc welding. Permanently pliable headband is made of plastic; chin strap has been eliminated.

PLASTIC BELT GUARD—*Bassons Industries Corp, 1432 West Farms Road, Bronx, NY.* Said to be stronger than cast iron and to absorb vibrations without rattling.

FACE SHIELDS — *American Optical Co, Southbridge, Mass.* Redesign provides 5/8-in. additional clearance between face and window. Windows are clear or made of green acetate.

GOGGLES—*Watchemoket Optical Co, Providence, RI.* Incorporate plastic telescoping templets. Methacrylate lens is 0.080 in. thick; clear or shades of green with black eye shields. Model 55.

HANLE COATINGS—*Custanite Corp, Larchmont, NY.* Hammers and handrifts are coated with Slipruf to provide friction surface said to be greaseproof.

TOE CLIP — *Standard Safety Equipment Co, 232 W Ontario St, Chicago, Ill.* Detachable steel shell which fits over work shoes. Can be mounted with spring or wire or nailed in place.

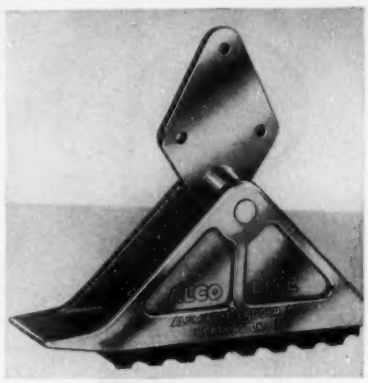
MAGNIFYING LENSES — *Bausch & Lomb Optical Co, 635 St Paul St, Rochester, NY.* Designed to aid welders wearing bifocal glasses. Available in four powers with range to fit need of most bifocal wearers.

APRONS—*B F McDonald Co, Los Angeles, Calif.* Glass-coated bullet-proof aprons designed for protection against flying metal particles. Weight is 3 lb.

ALARM UNIT — *Panalarm Products, Inc, 6312 N Broadway, Chicago, Ill.* Remote visual trouble signals operate at part of plant-wide audio-visual annunciator system. All signals connect to common horn or bell.

SAFETY DOORS—*Clark Door Co, Inc, Newark 8, NJ.* Automatic reversing switch reverses door instantly if it begins to close on obstruction. Can be operated manually. Prest-O-Matic.

EYE MAGNET — *General Scientific Equipment Co, 2700 W Huntington St, Philadelphia, Pa.* For removing foreign materials from the eye. Price: $2.50.



LADDER SHOE — *Aluminum Ladder Co, Worthington, Pa.* For straight and extension ladders; rubber tread or spike. Price: $4.50 per pair.

SOUND BOOTH—*Architectural Products Div, Burgess-Manning Co, 5970 Northwest Highway, Chicago, Ill.* Shields head and shoulders for telephoning in noisy locations.

SAFETY HATS—*US Safety Service Co, 1215 McGee St, Kansas City, Mo.* Meet ASA code for dielectric breakdown and exceed code for impact resistance. Cradle adjusts to fit.

SKIN OINTMENT—*Arnar-Stone Laboratories, Inc, 1316 Sherman Avenue, Evanston, Ill.* Repels water and moisture while allowing normal skin respiration. May be used before or after exposure.

FLASHLIGHT—*Lennan Products, Inc, 4407 San Fernando Rd, Glendale, Calif.* Explosion-, water-, vapor-, and damage-proof. Sealed-in head is removable for changing batteries or bulbs. Uses two cells with three-way kick. Model K-2.

SAFETY SIGNS—*Western Lithograph Co, 600 East Second St, Los Angeles, Calif.* 200 standard signs printed on heavy fabric with self-adhesive backing.

PLASTIC GOGGLES—*American Optical Co, Southbridge, Mass.* Provide frontal and lateral protection through clear plastic lense and transparent green vented blinders. Type AO 481.

FIRE EXTINGUISHERS — *Walter Kidde & Co, Inc, Fyre-Freez Div, Belleville, NJ.* Carbon dioxide; 2½, 5, 10, 15, and 20 lb. Normal hand pressure actuates extinguisher after removing safety pin.

SPRAY HEAD — *Automatic Sprinkler Corp of America, Youngstown, Ohio.* Said to provide superior distribution and fine breakup of water. Installed at ceiling for vertical coverage of floor.

FIRE EXTINGUISHER — *American-LaFrance-Foamite Corp, Elmira, NY.* One-qt, trigger-operated; for class B and C fires. Will not freeze down to –65 F; discharges in any position within 75° of vertical.

EXTINGUISHER — *Eston Chemicals Div, American Potash & Chemical Corp, 3030 W 6th St, Los Angeles, Calif.* Agent is said to be several times as efficient as carbon tetrachloride with much lower toxicity level. Methylene chlorobromide.

EMERGENCY LIGHTING — *General Scientific Equipment Co, 2700 W Huntingdon St, Philadelphia 32, Pa.* Trickle-charge maintains storage battery in portable set; hydrometer indicates state of battery. 100-cp beam provides 10 hr of light. Price: $120.50. Model E.

FIRE EXTINGUISHER — *American-LaFrance-Foamite Corp, Elmira, NY.* Redesigned to include faster-acting valve. Safety disk is side-mounted.

EXTINGUISHERS — *American-LaFrance-Foamite Corp, Elmira, NY.* Foamite and soda-acid extinguishers are now labeled with pictorial operating instructions.

INSULATION MATERIAL — *Gustin-Bacon Mfg Co, Kansas City, Mo.* Glass fiber, fire- and mold-resistant, resilient, and vibration-resistant. Can be cut with shears and applied to heated equipment within limit of 450 F.

CANVAS CURTAINS—*Eastern Equipment Co, Inc, Willow Grove, Pa.* Flame-resistant; sizes to over 100 sq ft. Curtains have grommets on one side; blankets have grommets in four corners.

FIRE BLANKET — *Standard Safety Equipment Co, Chicago, Ill.* Vinyl, plastic-coated glass cloth 76x60 in. in area.

FIRE FIGHTER — *American - La-France-Foamite Corp, Elmira, NY.* Wheeled engine has capacity discharge of 150 lb of Alfco quick-smothering dry chemical. 480-lb unit is designed for one-man operation. Model 150.

CALCULATOR—*Curta Calculator Co, 3851 W Madison St, Chicago 24, Ill.* Hand-model calculator redesigned to handle problems of 11x8x15 digits. Weighs 12 oz.

ANNUNCIATOR SYSTEM—*Panalarm Products, 6312 North Broadway, Chicago 40, Ill.* Complete interchangeability of circuits and functions provides both audible and visible alert. 3 to 54 individual signals.

RESPIRATOR — *Mine Safety Appliances Co, Braddock, Thomas & Meade Sts, Pittsburgh, Pa.* Protects against organic vapors and acid gases. Replaceable plastic cartridge contains treated charcoal.

FOG NOZZLE—*Bete Fog Nozzle, Inc, Greenfield, Mass.* For 1½-in. hose. Fog capacity is 25 or 50 gpm; stream capacity 100 gpm.

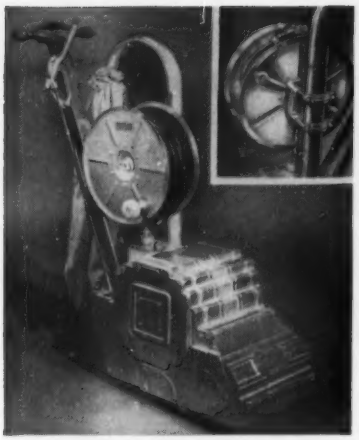
CONTROL COMPUTER — *American Hydromath Corp, 145 W 57th St, New York 19, NY.* Circular rule presents in one setting upper and lower limits for number of rejects to be expected in sample of given size. Covers sample lots from 2 to 1000. Price: $4.95.

LABELS—*W H Brady Co, Milwaukee, Wis.* Self-sticking write-on type combining printed form and blank space.

PAWL FASTENER — *Southco Div, South Chester Corp, Lester, Pa.* For use on doors requiring small strong latch. Knurled knob attached with rivets or spot welds.

RELEASE COATING—*W H Brady Co, 727 W Glendale Ave, Milwaukee 12, Wis.* Permits instantaneous removal of self-sticking markers from Brady dispenser cards.

BAR KNOBS — *Morton Machine Works, 2421 Wolcott, Detroit 20, Mich.* Cadmium-plated malleable iron knobs are available in 2½- and 3½-in. size.



ELECTRIC CORD REEL—*Industrial Electrical Works, Room B336, 1503 Chicago St, Omaha 2, Neb.* Equipped with mounting bracket for attaching reel to frame or handle of portable power equipment. Features adjustable brake and lock.

MAINTENANCE MACHINE — *Wilshire Power Sweeper Co, Glendale, Cal.* Quickly converts to suction or blowing; dual clutches permit stopping brush reel while operating air system; pickup wand reaches up to shelves. Pulls over 350 cfm. Two gas-powered models have swaths of 24 and 36 in.

NEOPRENE MESH—*Research Products Corp, 1015 E Washington Avenue, Madison 10, Wis.* Prevents delicate articles from being scratched; available in rolls 26 in. wide and 50 ft long. Can be cut with scissors.

TREATED CLOTH — *Hygiene Research, Inc, 684 Broadway, New York, NY.* For cleaning and mistproofing glass and mirrors. Effectiveness lasts from few hours to two weeks. See-cloth.

SHELTER SIGN — *Halco Co, 165 Dwight St, New Haven 2, Conn.* Permanently affixes to any smooth surface. Two parts enable arrow to point in any direction.

LINED BAGS—*Jet-Pak Inc, 859 Summer Ave, Newark, NJ.* Protect metal parts from rust and corrosion for 10 years. VCI lining blankets parts with dry vapor.

LABELING TAPE—*Labelon Tape Co, Inc, 450 Atlantic Ave, Rochester 9, NY.* Sticks without moistening. Unaffected by temperature changes between –40 and +150 F.

INDUSTRIAL WIPER — *Scott Paper Co, Chester, Pa.* Packaged in compact box containing 125 wipers. Each wiper consists of two sheets welded together. Chemical treatment creates wet strength.

HAND CLEANER—*Magnus Chemical Co, Inc, Dept AM, Garwood, NJ.* Waterless. White, stiff jell containing lanolin; leaves no odor.

DISPENSER—*Mine Safety Appliances Co, Braddock, Thomas and Meade Sts, Pittsburgh 8, Pa.* Fits jars of Fend barrier creams used as protection against dermatitis. Price: $.50.

WATERLESS WASHSTATION—*Sugar Beet Products Co, Saginaw, Mich.* Equipped with two paper towel dispensers and dispenser for SBS-30 waterless skin cleanser. Price: $50.00.

COTTON GLOVES SERVICE — *US Industrial Glove Corp, 9350 Roselawn, Detroit, Mich.* Gloves are reconditioned by dipping in plastic. Said to assure full reusability at fraction of replacement cost.

LENS CLOTH—*Carol Chemical Products Corp, 368 E 45th St, Brooklyn, NY.* For use on glass or plastic surfaces to prevent formation of fog or steam. Cloth cleans and fog-proofs in one operation. No-Mist.

LENS CLEANING STATION — *The Silicone Paper Co of America, Inc, 230 Park Ave, New York, NY.* For areas necessitating cleaning of plastic goggles. Can contains 400 applications of fluid and is securely locked to steel dispenser. Each carton of tissues contains 18 refills.

PLUGS—*CaPlugs Div, Protective Closures Co, 2207 Elmwood Ave, Buffalo 22, NY.* Protect threading, tube ends, and fittings of products during storage and shipping. Made of flexible plastic resistant to all common chemical reagents. Standard sizes fit dia from ⅛ to 1½ in.

MARKING TAPE—*Labelon Tape Co, 450 Atlantic Ave, Rochester 9, NY.* Flat labels, bound in tablet form, can now be typewritten. Each sheet is 3¼x11 in. and six widths are available. Price: $1.15.

PRE-PRINTED TAPE—*Labelon Tape Co, 450 Atlantic Ave, Rochester 9, NY.* Eliminates drafting of repetitive symbols in plant layout planning. Standard symbols for walls, aisles, conveyors, shafts, stairways, etc.

ID MARKERS—*North Shore Nameplate Co, Glenwood Landing, LI, NY.* Standard code cards include solid numbers, solid letters, and combinations of both, sequence numbers and letters, as well as standard electronic and electrical terms. Speedy Marx.

MARKER-COUNTER — *May Engineering Co, 6055 Lankershim Blvd, N Hollywood, Calif.* Electric machine which marks and counts items. Audible click registers each count. Price: $87.50.

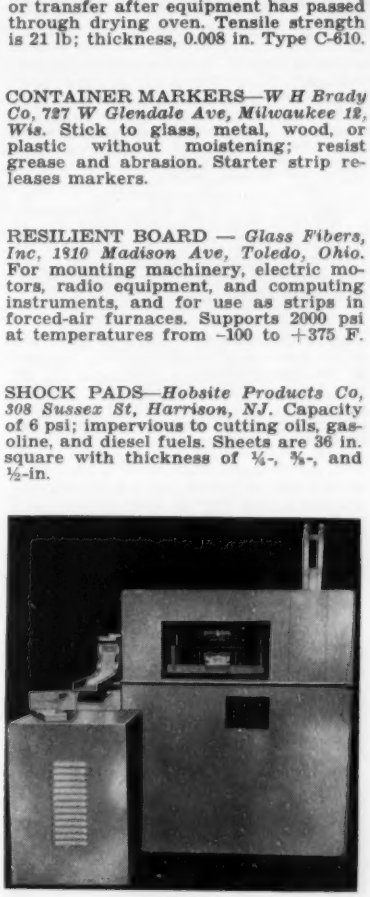
STEP LADDERS WALKWAY—*Ballymore Co, Wayne, Pa.* Dual safety step ladders are equipped with connecting walkway. Purpose is to eliminate passages blocked by conveyor systems. Folds up when not in use.

MASKING TAPE — *Armo Adhesive Tapes, 520 E 6th St, Michigan City, Ind.* Strips off without leaving residue or transfer after equipment has passed through drying oven. Tensile strength is 21 lb; thickness, 0.008 in. Type C-610.

CONTAINER MARKERS—*W H Brady Co, 727 W Glendale Ave, Milwaukee 12, Wis.* Stick to glass, metal, wood, or plastic without moistening; resist grease and abrasion. Starter strip releases markers.

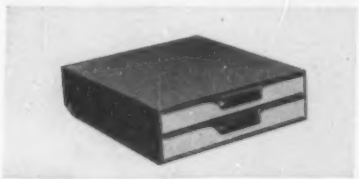
RESILIENT BOARD — *Glass Fibers, Inc, 1810 Madison Ave, Toledo, Ohio.* For mounting machinery, electric motors, radio equipment, and computing instruments, and for use as strips in forced-air furnaces. Supports 2000 psi at temperatures from –100 to +375 F.

SHOCK PADS—*Hobsite Products Co, 308 Sussex St, Harrison, NJ.* Capacity of 6 psi; impervious to cutting oils, gasoline, and diesel fuels. Sheets are 36 in. square with thickness of ⅛-, ⅜-, and ½-in.



TAG EMBOSSER — *Dashew Business Machines, Inc, 847 N La Cienega Blvd, Los Angeles 46, Calif.* Embosses metal addressing plates and simultaneously notches plates for classification, loops wire through tag hole, and inks embossed characters. DBM Databosser.

PLANT SERVICE EQUIPMENT—miscellaneous



PARTS CABINET — *Precision Equipment Co, 3714 Milwaukee Ave, Chicago 41, Ill.* Consists of two 1½-in. drawers in one-piece frame. Tabs engaging shelf above allow units to be stacked. Price: $8.90.

SMALL PARTS CABINETS — *Akro-Mils, Inc, Box 989, Akron 9, Ohio.* Single units provide from 8 to 384 separate compartments with max of three compartments per drawer. Storage cabinets are made in 24 different stock models, some with plastic drawers.

SMALL-PARTS CABINETS — *Bay Products, Inc, 3009 N Sixteenth St, Philadelphia, Pa.* For benches, counters, and shelves. Slots on 1-in. centers in drawers permit quick rearrangement.

BENCH UNIT—*Schieber Sales Co, Detroit 23, Mich.* Consists of two 14-ft tables and four 14-ft benches which fold and lock into caster-equipped truck. Parts have welded tubular steel understructures and Philippine mahogany plywood tops.

CABINET — *US Hoffman Machinery Corp, Air Appliance Div, 105 Fourth Ave, New York, NY.* For storing industrial vacuum-cleaning hose and tools. Made of 18-gage welded steel; size is 40x78x18.

GAGE CABINETS — *Size Control Co, Div American Gage & Machine Co, 2500 W Washington Blvd, Chicago 12, Ill.* Mahogany. For holding Size Control gage sets; space is provided for separate collets to fit universal handle for each plug member.

V-BELTS—*Manheim Mfg & Belting Co, Manheim, Pa.* For D & E drives; said to be easiest to couple and uncouple, belts are joined by riveted studs with removable cup washers and T-screws. Standard rubber-coated and oil-proof belts are available.

RIVET COOLER—*Ace Cabinet Corp, National Sales Office, 1457 Broadway, New York, NY.* Refrigerator for aluminum rivet storage. Automatic system will maintain rivet temp as low as 30 F.

WORKBENCHES — *Industrial Bench & Equipment Mfg Co, 97 South St, New Britain, Conn.* Maple tops, sanded and finished with paraffin on face and edges. Widths of 24, 30, 36, and 42 in.; lengths of 3, 4½, 5, 6, 8, 9, and 10 ft.

WORKBENCHES — *Shure Mfg Corp, 1601 S Hanley Rd, St Louis 17, Mo.* Lengths from 48 to 72 in. and widths from 29 to 36 in. Choice of tops includes steel, hardwood, or Nat-Flex (plastic composition).

BENCH DRAWERS—*Industrial Bench & Equipment Manufacturing Co, 97 South St, New Britain, Conn.* Sizes to fit any workbench; equipped with cylinder locks or padlock attachments. Closed tops prevent wedging of contents.

WORK STAND—*Industrial Bench & Equipment Manufacturing Co, Inc, 97 South St, New Britain, Conn.* Single steel angle runs across top of stand and forms two legs. Eight models, with or without doors or casters, with two or three trays.

BENCH TOPS — *Industrial Bench & Equipment Manufacturing Co, 98 South St, New Britain, Conn.* Maple edge-grain tops available as individual units. Widths range to 48 in., lengths to 16 ft. Working surface is clear.

BENCH LEGS — *Industrial Bench & Equipment Manufacturing Co, 97 South St, New Britain Conn.* Fressed-steel legs permit construction of custom-made benches in any length. Single, double, or wall models.

WORKBENCH—*Shore Woodwork Co, 894 N 40th St, Philadelphia 4, Pa.* Tops are laminated hard maple in 2 or 3-in. thicknesses. Standard sizes are 30x48, 60, 72, or 96 in.

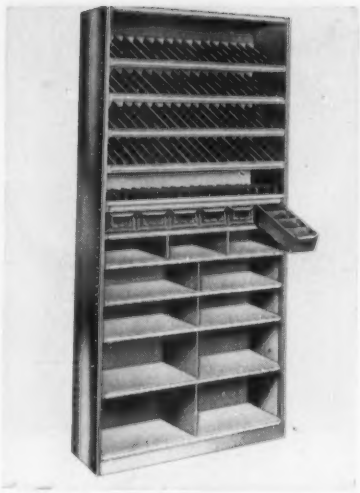
PROTECTIVE COATING — *Flexrock Co, Protective Coating Div, 3600-A Filbert St, Philadelphia 4, Pa.* Against corrosion caused by acids and alkalis; plastic resin. Applies over old paint; has good adhesion to metal, wood, or concrete. Flexcoat.

V-BELT KITS — *Brammer Corp, 684 Broadway, New York 12, NY.* For replacing broken belts without dismantling machinery. Four kits of various size belting.

PROTECTIVE WRAPPING—*Sherman Paper Products Corp, Newton Upper Falls, Mass.* For metal parts. Adheres to itself with simple pressure. Available in 600-ft rolls with widths from 12 to 48 in. Spot-Seal.

PLASTIC COATING—*Adhesive Products Corp, 1660 Boone Ave, New York, NY.* Hot-dip strippable coating for protecting tools and parts during processing, storage, and shipping.

STRIPPABLE COATING — *Chemical Development Corp, Danvers, Mass.* Protects aluminum, glass, and phenolics; can be used in place of masking tape on any surface. Applied by dipping, spraying, or brushing. Coating is bright red. CD strip 100.



BIN UNIT SHELVES — *Lyon Metal Products, Inc, Aurora, Ill.* Vertically adjustable; 3 ft wide, 1 ft deep, and 6½ ft high.

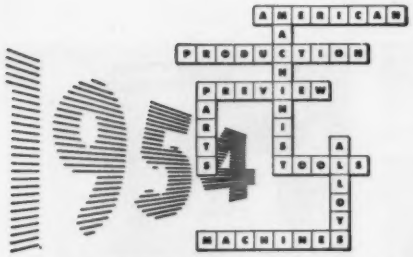
MACHINE-SIDE STAND — *Industrial Bench & Equipment Manufacturing Co, Inc, 98 South St, New Britain, Conn.* With feet or casters; 1, 2, or 3 trays and draws.

HANDWHEEL — *The Lunkenheimer Co, Cincinnati 14, Ohio.* Four finger-spaced lugs project from stem hub to give better grip.

ANTI-FOG LIQUID—*Industrial Products Co, 2844 N Fourth St, Philadelphia 33, Pa.* Cleans and treats glass and plastic surfaces. Contains silicones; packaged in 4-oz squeeze-spray plastic bottles.

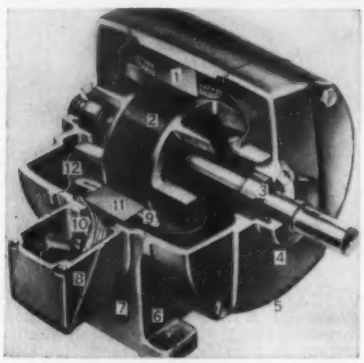
FLASHING BULLETIN BOARD—*Industrial Products Co, Philadelphia, Pa.* Carries two separate messages; operates on 40-w lamp flashing 15 times a minute.

INDUSTRIAL SCALES—*Toledo Scale Co, Telegraph Rd, Toledo 1, Ohio.* Full line from bench to motor truck models. Indicating heads can face in any of eight directions or swivel through full circle. Platform areas have been increased while over-all dimensions have been reduced.

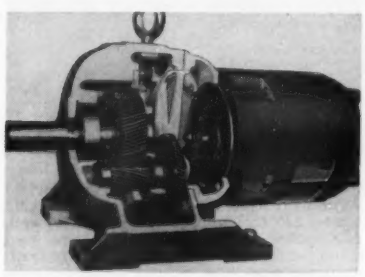


PARTS AND MATERIALS

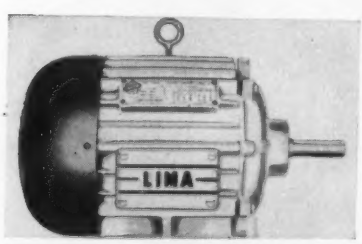
summarized from descriptions published during 1953



MOTORS—*General Electric Co, Schenectady 5, NY.* Polyphase motors are 50% smaller and 22% lighter per hp than previous design. Two models: totally enclosed fan-cooled and horizontal drip-proof. Motors have higher full-load speed rating and greater efficiency than former models. Insulation system uses a polyester film said to be eight times as strong. Available ratings are 1, 1½, and 2 hp at 1800 rpm. Tri-Clad "55."

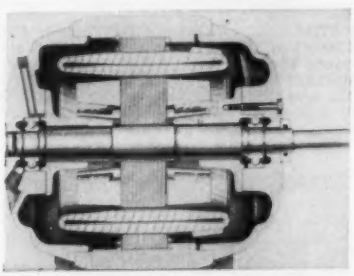


GEARMOTORS—*Century Electric Co, 806 Pine St, St Louis 3, Mo.* Integral series ranges from 1 to 15 hp; single, double, and triple gear reductions. Constant or variable speeds.

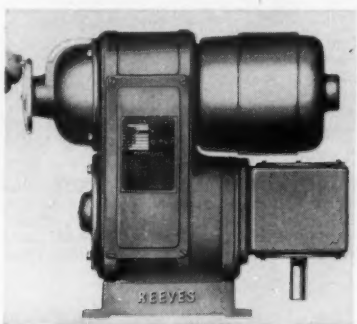


INDUSTRIAL MOTORS—*Lima Electric Motor Co, Dept 103, Lima, Ohio.* Ratings range from ¾ hp at 900 rpm to 20 hp at 3600 rpm. Supplied for vertical, wall, or ceiling mount as well as horizontal floor mount. Motors have two- or three-phase supply with all standard voltages and frequencies below 600 v. Type E.

HOLLOW SHAFT MOTOR—*Reuland Electric Co, Alhambra, Calif.* For use in conjunction with magnetic brake to permit motor shaft to extend through brake. Applications include lapping, honing, spinning, and turning.



ENCLOSED MOTOR—*US Electrical Motors, Box 2058 Terminal Annex, Los Angeles 54, Calif.* For service where dampness, dust, fire-hazards, and corrosive fumes are prevalent. Drain plug releases interior water. Ranges from 1/3 to 2 hp, fan-cooled to 75 hp. Type SS.

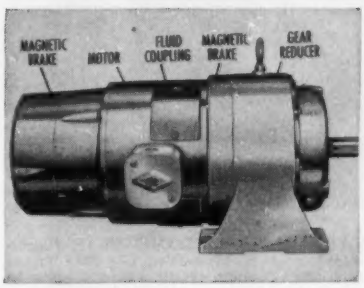


VARIABLE-SPEED DRIVE—*Reeves Pulley Co, Columbus, Ind.* Right-angle reducer combines in one unit any standard NEA frame, type C, face-mounted motor; Reeves speed-varying mechanism; and worm gear reducer. Fractional-hp drives in horizontal and vertical models with speed ratios from 2:1 to 10:1.

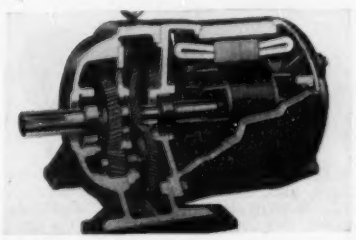
MAGNETIC STARTER—*Furnas Electric Co, 1044 McKee St, Batavia, Ill.* Now available in 2½-in. size; controls include reversing types. Series YG.

STARTER—*Square D Co, 4041 N Richards St, Milwaukee, Wis.* Vertical-action; smaller than clapper model it replaces. Max polyphase ratings are 50 hp, 220 v and 100 hp, 440/550 v.

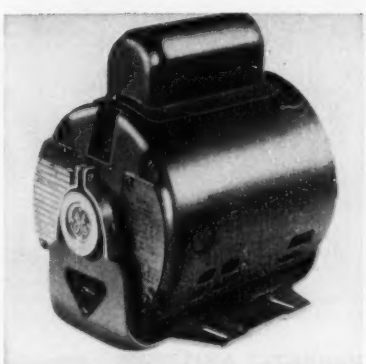
MOTOR ENCLOSURE—*General Electric Co, Schenectady 5, NY.* Makes GE ac combination motor starters lint-tight. Can be inspected without opening control case.



CONTROLLED MOTOR — *Reuland Electric Co, Alhambra, Calif.* Designed to provide fluid-cushioned stops and starts with added advantage of holding brake. Unit consists of magnetic brake, motor with internal-fluid coupling, second magnetic brake, and gear reducer.

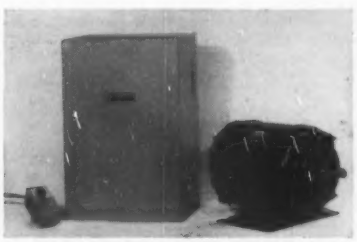


GEARMOTORS—*Elliot Co, Crocker-Wheeler Div, Ampere, NJ.* Integral power units with single-, double-, and triple-speed reduction; sizes from 1 to 150 hp. Mounting may be horizontal, ceiling, sidewall, or inclined.

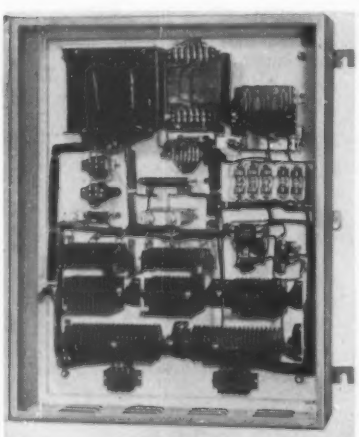


SPECIAL MOTORS—*General Electric Co, Schenectady, NY.* For applications requiring moderately high starting torque. Rated at ½ and ¾ hp at 1725 rpm.

VARIABLE-SPEED DRIVE—*Reliance Electric & Engineering Co, 1088 Ivanhoe Rd, Cleveland 10, Ohio.* Includes drive motor, operator control station, and control unit. Operates at any speed from 270 to 2300 rpm and as low as 75 rpm for setup operations.

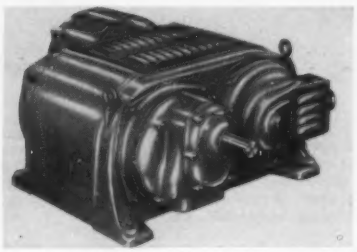


MOTOR CONTROLS — *Electro-Devices, Inc, 4-6 Godwin Ave, Paterson, NJ.* Servospeed electronic variable-speed motor-control systems up to 3 hp. Motor series field is used as torque signal source and feedback circuit.

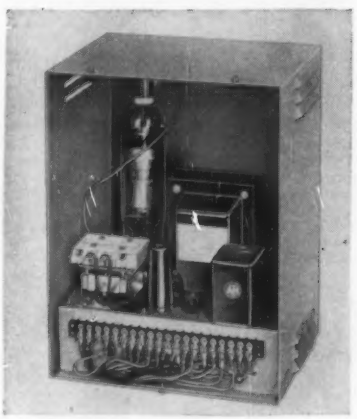


MAGNETIC AMPLIFIER — *Franklin Control Corp, 1975 S Allis St, Milwaukee, Wis.* Speed drive for standard 230-v dc motor gives range from 49 to 2450 rpm. Unit uses no tubes—only magnetic amplifiers and selenium rectifiers. Said to hold constant speed even at twice rated load.

MOTOR-GENERATOR UNIT — *Georator Corp, Manhassas, Va.* Converts 60 c to 400 c. Vertical two-bearing converter is said to require minimum maintenance.

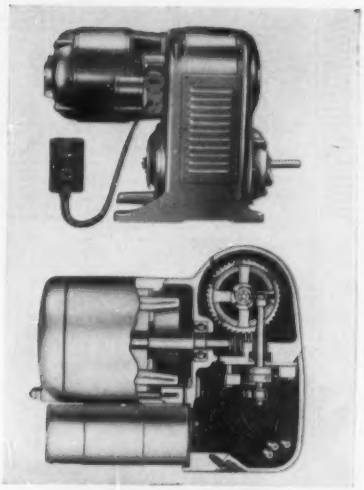


VARIABLE-SPEED DRIVE — *US Electrical Motors Inc, Box 2058 Terminal Annex, Los Angeles 54, Calif.* Horizontal motors with ratings to 30 hp; available in combination with US Synchrogear with either single or double reduction gearing. Type 64VE.

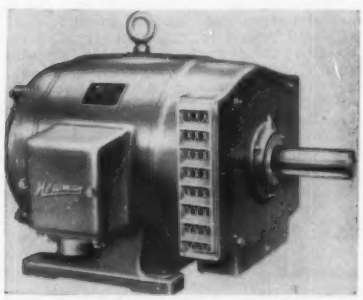


ELECTRONIC DRIVE MOTOR—*The Arrow-Hart & Hegeman Electric Co, 103 Hawthorn St, Hartford 6, Conn.* Provides wide, stepless range with good speed regulation from 100 to 3500 rpm.

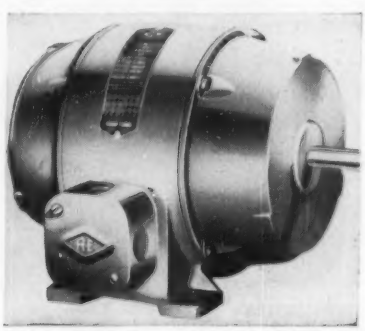
MIDGET ELECTRIC MOTORS—*General Die and Stamping Co, 262 Mott St, New York 12, NY.* Gear trains with single or multiple shafts give one or more speeds from 1 to 1150 rpm. Seven semi-enclosed models and one open model.



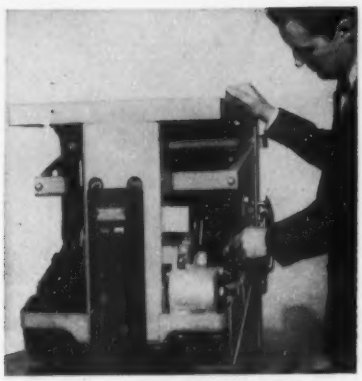
VARIABLE-SPEED MOTOR — *US Electrical Motors Inc, Box 2058, Los Angeles, Calif.* Remote-control auxiliary motor provides positive electrically driven control. Auxiliary unit is 1/15-hp, 1800-rpm reversible capacitor model.



MOTORS—*Newman Industries, Inc, 43 Broad St, New York, NY.* Complete line up to 230 hp includes totally enclosed, fan-cooled squirrel cage motors and open drip-proof enclosures in both squirrel cage and wound rotor designs. Conduit box is fitted on left side of motor on drive end. British—Newman.

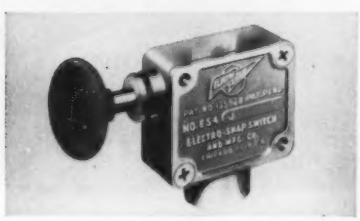


MULTI-SPEED MOTORS — *Reuland Electric Co, Alhambra, Calif.* Range from 12 to 150 hp; 2-, 3-, or 4-speed ratings in constant torque, variable-torque, or constant-hp types.



SWITCHGEAR—*General Electric Co, Switchgear Dept, Philadelphia, Pa.* For ratings of 600-v ac and below. Air circuit breakers withstand 30-c momentary currents equal to their interrupting ratings (15,000 and 100,000 amp). Continuous-current ratings range from 15 to 4000 amp.

POWER SWITCH—*Trumbull Electric, Plainville, Conn.* Taps power from FVK bus; can be installed in three minutes. Ratings are 30, 60, 100, and 200 amp. Flex-A-Plug.



LIMIT SWITCH—*Electro-Snap Switch & Manufacturing Co, 4218 West Lake St, Chicago, Ill.* Minimizes need for relays in automatic sequencing operation. Rated at 10 amp. Type ES4-J.

SOLENOID — *Dormeyer Industries, 3418 N Milwaukee Ave, Chicago, Ill.* Has reversible coil changeable in the field. No. 230 delivers 6.5 in.-lb per stroke; No. 231, 9.5.

FOOT SWITCH—*Lectromatic Devices Corp, 3345 Addison St, Chicago, Ill.* Starts and stops electrically operated equipment. Current rating is 15 amp at 115 v.

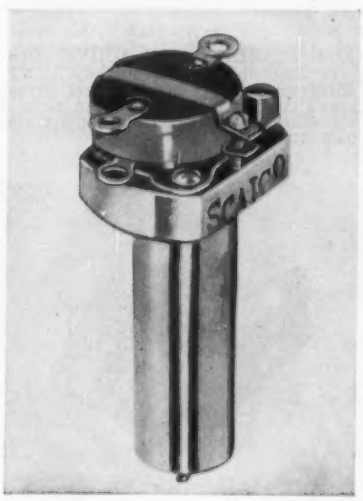
TOGGLE SWITCHES — *Minneapolis-Honeywell Regulator Co, Micro Div, Freeport, Ill.* Riveted solid silver contacts prevent loosening and reportedly provide max conductivity and heat dissipation.

TOGGLE SWITCH—*Riverside Manufacturing & Electrical Supply Co, 10228 Michigan Ave, Dearborn, Mich.* Functions from —65 to +165 F. Dimensions are 2¼x2—⅝x3½ in. with toggle extending 1-7/16 in. at full travel.

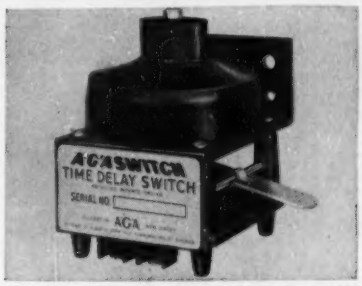
SWITCHES—*Micro Div, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* Snap action with actuating forces as low as ½ oz; operation by cams or straight-line motion, 15 amp ac, ½ and ¼ amp dc.

PRECISION SWITCH — *Electro-Snap Switch and Mfg Co, 4220 W Lake St, Chicago 24, Ill.* Eight-terminal; provides instantaneous switching of two circuits with different characteristics. Up to four circuits can be operated simultaneously. Rating is 15 amp at 125/250 v ac or 10 amp at 30 v dc.

SNAP SWITCHES — *Haydon Switch Co, 232 N Elm St, Waterbury, Conn.* Hermetically sealed to withstand changes in pressure and temperature, high rates of acceleration, and corrosive elements. Life is 100,000 operations at rated load.



TEMPERATURE SWITCH — *Smith Control & Instrument Co, Inc, Market St, Palmyra, NJ.* Snap action for close control in range from 70 to 150 F. Sizes 2¼x1 in.; weight, 1.2 oz.

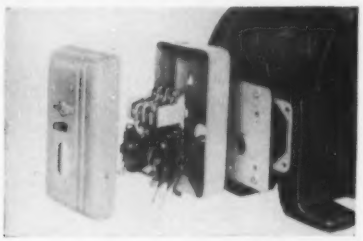


DELAY SWITCH — *AGA Division, Elastic Stop Nut Corp of America, Elizabeth, NJ.* Pressure against lever trips switch and time delay of 0.1 sec to 5 min starts upon release of pressure. Time delay is obtained by restricting airflow through adjustable orifice in timing head.

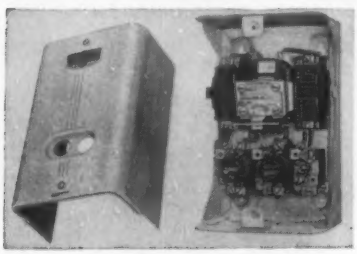
TOGGLE SWITCH—*Aronson Machine Co, Arcade, NY.* For welding positioner control; may be foot- or hand-operated. Encased in oil-tight steel enclosure. Model FPC.

SNAP SWITCHES — *Micro Division, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* For one-way actuation by cams, or slides. Roller is 3/16 or ⅜ in. in dia.

LINEAR SOLENOID — *Connecticut Telephone & Electric Corp, Meriden, Conn.* For jet aircraft fuel control system—now available for other uses in systems requiring proportional transfer of electrical energy to linear mechanical movement.



MOTOR STARTER—*Furnas Electric Co, 1044 McKee St, Batavia, Ill.* Can be mounted directly on motor in several positions. Motor-Mount.



MAGNETIC STARTERS — *Cutler-Hammer, Inc, Milwaukee, Wis.* Incorporate five unit construction for ease of installation and maintenance.

BATTERY—*Electric Storage Battery Co, 42 S Fifteenth St, Philadelphia, Pa.* Model TH is said to have 20% more capacity than previous models. Grids contain corrosion-resistant Silvium to increase battery life.

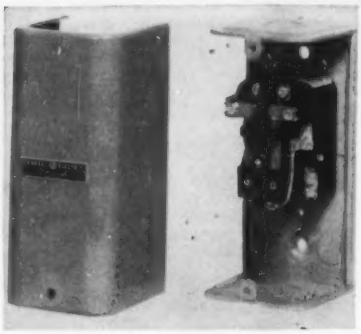
TRUCK BATTERIES — *Bowers Battery and Spark Plug Co, Reading, Pa.* Protected by five layers of insulation. Incorporates more active plate material.

INDUSTRIAL BATTERY—*Ray-O-Vac Co, Madison, Wis.* Fully sealed-in steel jacket top. Does not weaken with storage; need not be dated.

FLASHLIGHT BATTERY — *Burgess Battery Co, Freeport, Ill.* Heavy-duty size D said to have greatly extended service life. Sealed in steel and plastic.

RELAY PLUG-IN UNITS—*Tigerman Engineering Co, 4332 N Western Ave, Chicago 18, Ill.* Over 100 standard circuits, completely enclosed, dustproof.

ELECTRONIC MAGNETIZER —*Leo Klein-Electronics, 2404 S LaBrea Ave, Los Angeles, Calif.* Charges magnets contained in permanent-magnet units. Uses standard power supply. Model LG5.

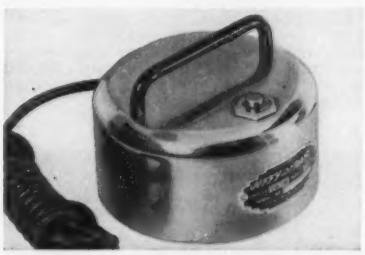


RELAYS—*General Electric Co, Schenectady 5, NY.* For application where small space and long life are major features. Rated from 6 to 300 v at 60, 50, 25 c or dc; 10-amp continuous-contact rating.

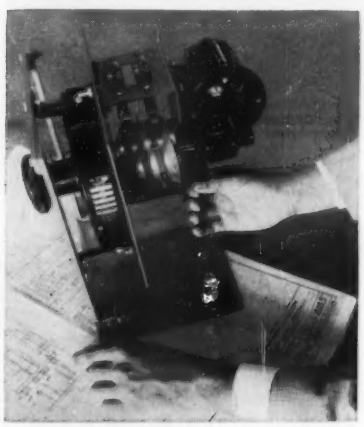
ADJUSTABLE-SPEED DRIVE—*General Electric Co, Schenectady 5, NY.* Electronic. Offers stepless and preset speed control with drive from ¾ to 3 hp. Standard speed ranges of 5:1 and 20:1. Uses 220/440 v.

SEALED RELAYS—*Automatic Electric Sales Corp, 1033 W Van Buren St, Chicago 7, Ill.* Designed for minimum inductance and maximum make-and-break speeds. Measures 2-1/32x31/32x 1½ in. and weighs 1⅞ oz.

DEMAGNETIZER — *The Martindale Electric Co, 1375 Hird Ave, Cleveland, Ohio.* For removing loose filings and chips from the edges of cutting tools. Model D-3.



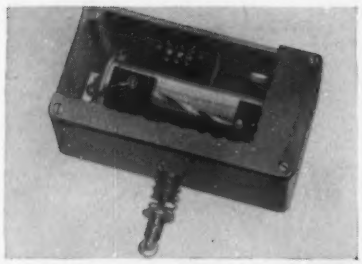
DEMAGNETIZER — *Rason Manufacturing Co, 3050 W 21st St, Brooklyn, NY.* For metals which have picked up filings. Uses standard electrical supply. Jiffy-Rase.



RHEOSTAT — *Westinghouse Electric Corp, Pittsburgh 30, Pa.* Adjusts speed of dc motors up to 200 hp and voltage of generators up to 300 kw. One gear ratio permits full travel in from 5 to 15 sec; the other in 15 to 45 sec.

RHEOSTATS—*Hardwick, Hindle, Inc, Newark, NJ.* Available in 50-, 75-, 100-, and 150-w ratings.

RHEOSTATS—*Ward Leonard Electric Co, 115 MacQuesten Pkwy South, Mt Vernon, NY.* Standard and multi-step types with 6-, 8-, and 13-in. dia and max summation watt ratings of 330, 450, and 1000. Control steps per plate range from 41 to 161. Bulletin 60A.

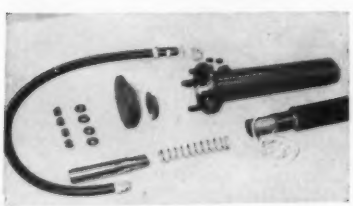


POTENTIOMETER — *Ward Leonard Electric Co, Mount Vernon, NY.* For industrial electronic control applications as constant-cutting-speed machine-tool drives. Unit interprets position of cutting tool as linear or nonlinear function, depending on shape of cam used.

POTENTIOMETERS — *Minneapolis-Honeywell Regulator Co, Industrial Div, Wayne & Windrim Aves, Philadelphia 44, Pa.* Electronic; for use with company circular chart Air-O-Line pneumatic controllers. Multiplying linkage provides proportional settings from 1 to 14% for full rotation of dial.

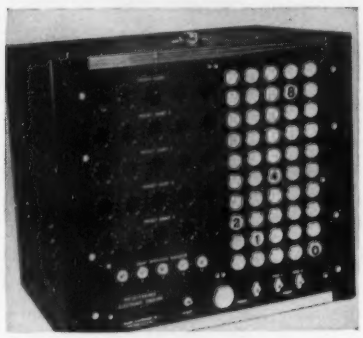
OVERLOAD PROTECTOR—*Lamson Corp, Dept A1, Syracuse, NY.* Protects chain drives from overload; counterbalance is adjustable for chain tension to 1000 lb. Locking lever requires manual resetting.

MAGNETIC BRAKES—*Dings Brakes, Inc, Milwaukee, Wis.* For all standard ac or dc electric motors. Torque ratings of 1½, 3, and 5 lb-ft. Brakes self-adjust for wear.

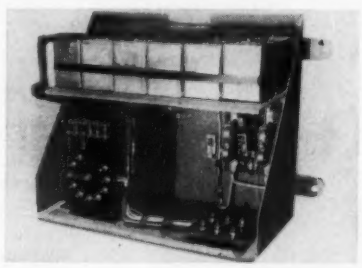


RAPPERS — *Research Corp, Bound Brook, NJ.* Magnetic-impulse rapping system delivers continuous light impacts in controlled intensities for electrostatic precipitators. Pulse generator delivers up to 24 tripping impulses per precipitator.

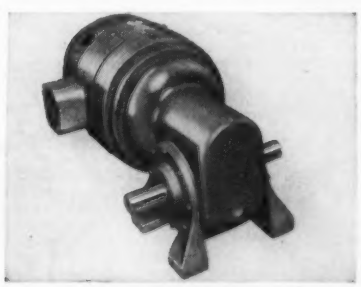
SYNCHRONOUS MOTORS — *Bristol Motor Div, Vocaline Co of America, Inc, 203 Coulter St, Old Saybrook, Conn.* For low-speed and light-load applications. Speeds from 10 rph to 1 per month; handles loads up to 1 in-lb.



ELECTRONIC COUNTER — *Haledy Electronics Co, 57 William St, New York 5, NY.* Counting speed up to 15,000 per min. Cold-cathode tube design gives long life. Control relay performs given function after specified number of counts. Model GW.



PHASE CONVERTER—*System Analyzer Corp, Milwaukee, Wis.* Converts single-phase to three-phase power; permits operation of NEMA class B and C variable-speed and two-speed motors from single-phase lighting service. System draws leading current from line, improving pf.



SPEED REDUCER—*Reuland Electric Co, Alhambra, Calif.* Right-angle unit converts high-speed output to low-speed high-torque output; permits simultaneous use of three outputs. Four models reduce speed to 18, 24, 36, or 58 rpm.

INTERLOCKING CONNECTOR — *Rodale Manufacturing Co, Emmaus, Pa.* Special right-angle lugs at tips of female contacts engage and support male blades. 2-, 3-, and 4-wire models rated for 10 and 20 amp.

MINIATURE BLOWER — *Electroflow Pumps, Inc, 4811 Anaheim-Telegraph Rd, Los Angeles, Calif.* For electronic equipment. Four sizes have wheel diameters of 1½, 2, 2½, and 3 in.

DIELECTRIC SEALER—*Adhesives & Coatings Div, Minnesota Mining & Manufacturing Co, 423 Piquette Ave, Detroit 2, Mich.* Synthetic rubber for use as flexible potting compound on electrical wiring connections. Said to retain physical properties through temperature range of —65 to 200 F. EC-1120.

FITTING—*The Thomas & Betts Co, Elizabeth, NJ.* For liquid-tight flexible conduit; recommended for wiring exposed to corrosive liquids and mineral oils.

ELECTRICAL CONDUIT — *American Brass Co, Waterbury, Conn.* Has tough, extruded synthetic covering over flexible metal core to protect wiring. Bends easily; can be cut to required length.

CIRCUIT RESTORER—*The Sherman Electric Co, Inc, 1807 Elm Rd, N E, Warren, Ohio.* For protection against incorrect heat control caused by failure of thermocouple circuits. Checks for these faults and makes automatic temporary repairs.

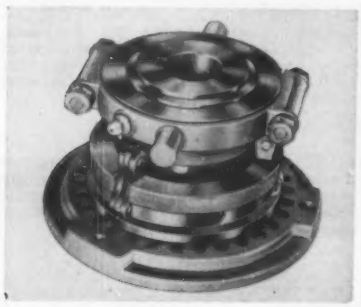
THERMOCOUPLE-PROTECTOR — *Minneapolis-Honeywell Regulator Co, Wayne & Windrim Avenues, Philadelphia, Pa.* Made of Incoloy which has properties similar to, but using half the nickel content of, Inconel.

INTERCOMMUNICATION — *Talk-A-Phone Co, 1512 S Pulaski Rd, Chicago, Ill.* Wireless two-station system plugs into standard outlet. Said to screen out line noises and hum.

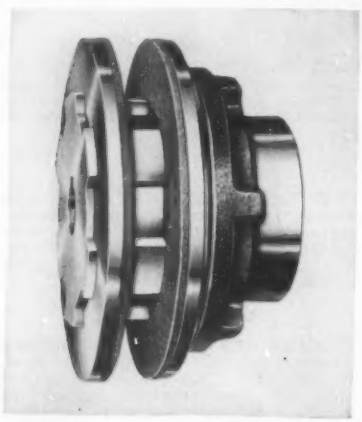
ELECTRONIC STETHOSCOPE—*Anco Instrument Div, 4254 West Arthington St, Chicago 24, Ill.* Locates friction noises in moving parts. Metal probe serves as microphone transmitting sound through amplifier to earphones. Elec-Detec.

ELECTRONIC DELAY UNIT—*Bliley Electric Co, Union Station Bldg, Erie, Pa.* Electrical energy is converted into sound energy, passed through the fused quartz, and reconverted into electrical energy by transducers. Transit time can be held to close tolerance.

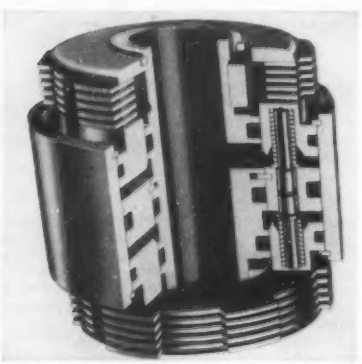
DIESEL ENGINE — *Hallet Mfg Co, Inglewood, Calif.* Two-cylinder, air-cooled; 13 hp for continuous load, 14 hp for intermittent duty.



DISK CLUTCH—*Carlyle Johnson Machine Co, Manchester, Conn.* Designed for light machinery service up to 6 hp. Floating disk rides free and neutral. No. 350 (3 hp), No. 450 (6 hp).



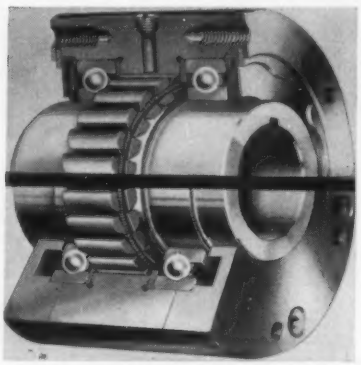
CLUTCHES—*Morse Chain Co, Detroit 10, Mich.* Torque-limiting to provide overload protection for machine drives in variety of equipment. Torque-capacity limit of drive is 260 ft lb. Made in sizes with diameters of 4½, 5½, and 6½ in.



OIL-ACTUATED CLUTCH—*Twin Disc Clutch Co, Racine, Wis.* Designed to provide higher and more constant torque capacity. Integral oil cylinder clamps plate stack.

VENTILATED CLUTCHES—*Federal Fawick Corp, 9919 Clinton Rd, Cleveland 11, Ohio.* For presses, brakes, shears, and forging machines; transmits power from friction shoes through torque bars to side plates. Drum-dia sizes range from 11.5 to 42 in.

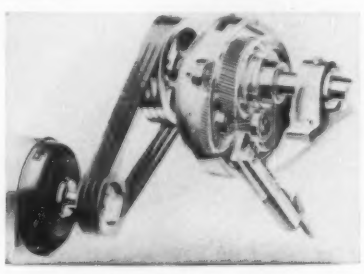
OVERLOAD CLUTCH—*Overload Release Clutch Co, Dept E, 1162 Stuyvesant Ave, Irvington, NJ.* For sprocket, chain, belt, and gear drives. Designed to allow machine to resume cycle of operations at exact point of release.



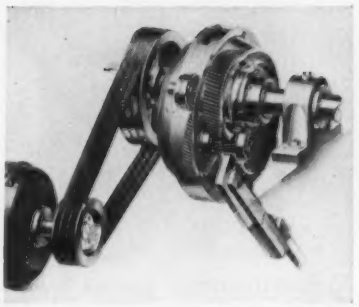
CLUTCH—*Formsprag Co, 23601 Hoover Rd, Van Dyke, Mich.* Centrifugal throwout sprag assembly makes it possible for over-running clutches to exceed 3000 rpm. Consists of outer housing, inner race, full complement of sprags, and energizing sprags.

VENTILATED CLUTCH — *Federal Fawick Corp, Airflex Div, Cleveland, Ohio.* Provides for power transmission from friction shoes through torque bars to metal sideplates. Sizes fom 12-through 42-in. drum diameter with torque capacity from 27,000 to 380,000 in.-lb. Style VC.

MITER GEAR BOXES—*Crown Gear, Inc, 290 West St, Keene, NH.* For transmission at right angles. Capacities are 1/3 and 1 hp at 1800 rpm. Each size has both two-way and three-way shaft extension.



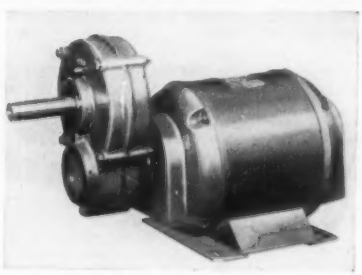
SPEED REDUCTION UNIT—*American Pulley Co, 4200 Wissahicken Ave, Philadelphia, Pa.* Shaft-mounted units with 13:1 ratio. Two trains of flame-hardened helical gears reduce driven shaft speed. Concentric shaft design places both input and output shaft above oil level.



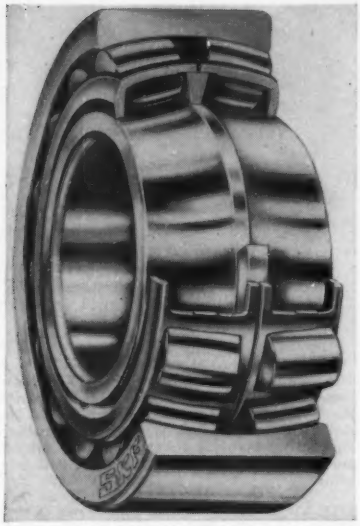
SPEED REDUCERS—*The American Pulley Co, 4200 Wissahicken Ave, Philadelphia 29, Pa.* 20:1 units have two trains of helical gears cut from alloy steel forgings. Can be mounted directly on shaft of driven machine with twice the shaft dia plus mounting clearance.

SPEED CHANGER—*Metron Instrument Co, 432 Lincoln St, Denver 9, Col.* Lever moves through arc of 63° to provide rapid changes of speed over 25 to 1 range. Completely enclosed; permanently lubricated. Type 3B.

GEAR SPEED REDUCER—*Philadelphia Gear Works, Venango & G Sts, Philadelphia 34, Pa.* Incorporates automatic shut-off device for overload protection. Ratios from 3⅝:1 up to 6300:1.



SPEED REDUCER—*Turner Uni-Drive Co, 3400 Terrace St, Kansas City, Mo.* Converts electric motors into geared motor reducers; fits 1800-rpm motors fom 1 to 5 hp, 1200-rpm motors from 1 to 3 hp. Model 3R3.

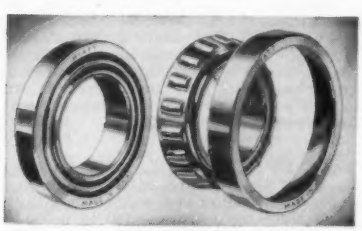


ROLLER BEARING—*SKF Industries, Inc, Dept 616A, Philadelphia 32, Pa.* Spherical design reportedly increases capacity by 25 to 50% and gives service life 2½ to 3 times longer than conventional type. Improvement has been accomplished without any change in size or weight.

SPLIT ROLLER BEARINGS—*Cooper Split Roller Bearing Corp, 700 Cedar Blvd, Pittsburgh 28, Pa.* Applied where it is impossible to mount conventional solid ball or roller bearings. Races are split on diagonal. Races and rollers are high-carbon chrome-alloy steel; cages are aluminum alloy.

CAGE ROLLER BEARINGS—*Inland Automatic, Inc, 1108 Jackson St, Omaha, Neb.* For slow-moving machinery. All components are hydraulically assembled for uniform stress.

THRUST BEARING—*Rollway Bearing Co, Inc, Seymour St, Syracuse, NY.* Modifications are claimed to raise load capacity by 9% and life by 29%. Design sets long roller slots of five rollers in alternate positions with short roller slots of four rollers. Retainer is centrifugally cast bronze.



BARREL BEARINGS — *Hyatt Bearings Div, General Motors Corp, Harrison, NJ.* Self-aligning bearings are designed to provide maximum load-carrying capacity through wide range of operating conditions. Angular contact bearings sustain radial, thrust, or combination loads.

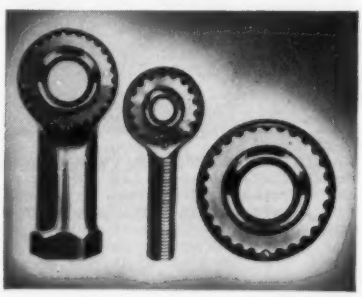
RADIAL BEARINGS—*The Nice Ball Bearing Co, Philadelphia, Pa.* For max speeds of 5000 rpm; chrome-alloyed balls; single-, double-, or non-shielded types. Series C.

MINIATURE BEARNGS — *Miniature Precision Bearings, Inc, Keene, NH.* Single- and double-shielded miniature fractional-inch bearings of both full race and retainer construction. Nine sizes down to 0.1562-in. OD. Available in chrome bearing steel or stainless.

INSTRUMENT BEARING — *New Hampshire Ball Bearings, Inc, Peterborough, NH.* Designed for low, uniform running torque and quiet operation. Flanged bearing has straight, rather than tapered OD. Micro FR188.

PLASTIC RETAINERS — *Synthane Corp, Oaks, Pa.* Thermosetting laminated plastics fabricated into ball-bearing retainers are said to allow speeds in excess of 100,000 rpm. Retainers for machine tools, spindles, and aircraft instruments can reportedly be machined within tolerances required for precision and super-pecision bearings. Close inspection forms vital part of fabrication process.

BEARING PILLOW BLOCKS—*Fafnir Bearing Co, New Britain, Conn.* Set includes separable two-piece pressed-steel housing, pre-lubricated wide-inner-ring ball bearing with self-locking collar, and contact-type Plya-Seals to provide grease retention. Housing is said to occupy less space than other pillow blocks for same size shaft.



SPHERICAL BEARINGS — *Lincoln Park Industries, Inc, 1719 Ferris Ave, Lincoln Park 25, Mich.* Variety of sizes and types. Ball race can be adjusted for accurate positioning—one notch is slightly less than 0.001 in. Bearings are pre-lubricated.

BALL BEARING UNITS — *Stephens-Adamson Mfg Co, Aurora, Ill.* Double extended race; zone-hardened through ball path section only to allow set-screws to bind tightly against soft race for positive locking. Shock- and vibration-resistance are said to be increased.

ROLLER BEARING—*Shafer Bearing Corp, Downers Grove, Ill.* Self-aligning, torque-tube type, double-row bearing is said to allow full freedom of rotation under all conditions of misalignment. Factory-lubricated and equipped with positive seals.

SHOCK ISOLATOR — *Connecticut Hard Rubber Co, New Haven, Conn.* For electronic equipment and delicate instruments. Load-deflection curve has decreasing slope. Rated loads from ½ to 1000 lb. Cohrlastic DS.

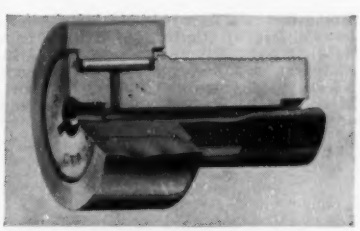
NOISE ISOLATOR—*The Barry Corp, 700 Pleasant St, Watertown 72, Mass.* Provides isolation above 20 cps for equipment with static loads of 15 to 200 lb per unit. Type 915.

VIBRATION ISOLATOR—*The Barry Corp, 700 Pleasant St, Watertown 72, Mass.* Designed to eliminate loss of efficiency due to damper packing. Spring returns damper to normal position on every cycle.

BUSHING — *Aeroquip Corp, Jackson, Mich.* Broached surface has series of minute cutting edges allowing greater variation in hole size and giving firm lock. Works with 0.002-in. tolerance.

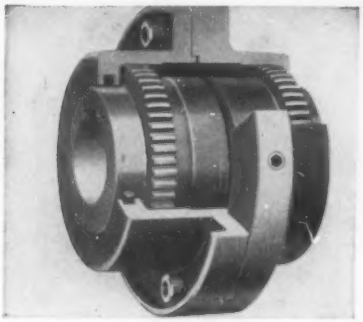
NEEDLE BEARING BUSHING—*J G Jergens Co, Cleveland, Ohio.* Provides absolute seal against dirt entering cavity. Protect against thrust as well as radial loads.

IMBEDDED BUSHINGS — *Hi-Shear Rivet Tool Co, 8924 Bellance Ave, Los Angeles 45, Calif.* Imbedded in laminate plastic drill templets shaped in same die forms that produced sheet metal parts to be drilled.



CAM FOLLOWER ROLLER — *Smith Bearing Co, Bear Tavern Rd, West Trenton, NJ.* Integral flange on stud makes possible large stud dia in relation to roller size. For applications requiring high speed and heavy load.

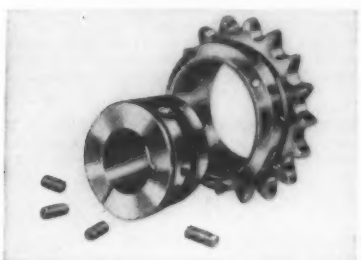
VARIABLE SPEED TRANSMISSION —*Graham Transmissions Inc, Menomonee Falls, Wis.* Redesign produces 50% more power, is same size as previous models. Tapered rollers slope downward from the input end to provide greater effective roller dimension in same space. Transmission has micrometer control for adjustment between 400 graduations. Model 28.



FLEXIBLE COUPLINGS — *Link-Belt Co, 307 N Michigan Ave, Chicago 1, Ill.* For high-speed and high-torque applications. Two-section free-floating housing has internally cut gear teeth. Bore sizes range from 1 to 6 in.; hp rating ranges from 2 to 450 at 100 rpm.

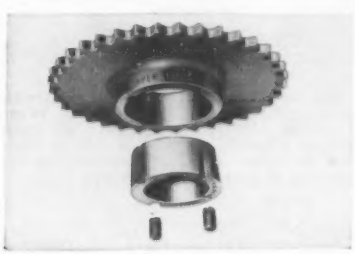
COUPLINGS—*Smith Power Transmission Co, 1545 E 23rd St, Cleveland 14, Ohio.* Said to permit greater misalignment with minimum shaft pressure on support bearings. Rubber bushings operate with conical deflection.

CASTER AND WHEEL — *Aerol Co, Inc, 2424 San Fernando Rd, Los Angeles, Calif.* Assembly is 12-in. dual-suspension shock-absorbing unit designed for smooth load-glide. Capacity is 2000 lb.



SPROCKETS—*Cullman Wheel Co, 1344 Altgeld St, Chicago, Ill.* Furnished in two series: tapered split bushings and split-hub type.

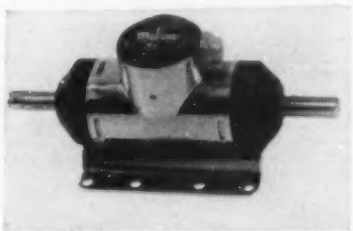
ROLLER CHAIN — *Baldwin-Duckworth, Div of Chain Belt Co, Springfield, Mass.* Riveted chain in ASA standard and heavy series, 1- through 2½-in. pitch size in multiple widths. Made up in 10-ft lengths of riveted chain with single pin coupler installed at intervals.



SPROCKETS, ROLLER CHAIN — *Dodge Manufacturing Corp, Mishawaka, Ind.* Wide range of sprocket and bushing sizes eliminates necessity of reboring to fit shafts. Sprockets are keyed to shaft; bushing may be reused.

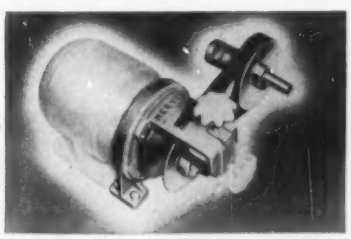
COUPLING—*Lovejoy Flexible Coupling Co, 5039 W Lake St, Chicago 44, Ill.* Has one hub cut off and three or more holes tapped in remaining flange to fasten coupling to center of flywheel.

CHAIN SPROCKETS — *Morse Chain Co, 7601 Central Ave, Detroit, Mich.* Keyed to shaft; no flanges; fit any roller chain from No. 40 to No. 100. Line includes pitches of ½, ⅝, ¾, 1, and 1¼ in. with up to 112 teeth.



MINIATURE SPEED CHANGERS—*Metron Instrument Co, 432 Lincoln St, Denver 3, Colo.* For recorders, flow controls, regulators, and scanning mechanisms. Output shaft speed can be infinitely varied from 1/5 to 5 times input speed by rotating control shaft with sput, miter-, or worm-geared remote controls.

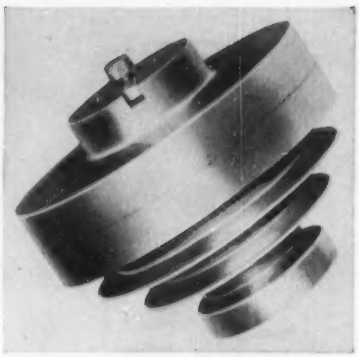
WORM DRIVE—*Durant Manufacturing Co, 1945 N Buffum St, Milwaukee, Wis.* Fits shafting from ⅜- to 1-in. dia; provides reduction ratio of 10:1.



VARIABLE SPEED DRIVE — *Reeves Pulley Co, Columbus, Ind.* Drives in any direction and delivers any speed within ratio of 8 to 1. Six belt lengths are available.

RETURN IDLER — *Chain Belt Co, Milwaukee 1, Wis.* Roller-bearing belt-training return idler provides automatic alignment for return belt without use of side guide idlers. Style 41 has standard 5- or 6-in. dia steel rolls; 41RC has 5½-in. dia rubber-covered spiral roll.

DOUBLE-RIBBED V-BELT—*US Electrical Motors Inc, Box 2058, Los Angeles 54, Calif.* Made of synthetic rubber. Said to add 25% more strength and reduce heat.



SPEED REDUCING PULLEY—*Pull-Gear Co, 4118 E 8 Mile Rd, Detroit, Mich.* Permits drilling up to 1⅜ in. in steel on drillpresses with ½-hp motor. Reducing sleeves adapt unit to three motor shaft sizes.

SHEAVE UNIT—*Allis-Chalmers Manufacturing Co, Milwaukee 1, Wis.* For paper machine back-lineshaft drives; suitable for application wherever outboard bearing is employed. Can be remotely controlled.

RAYON BELTING—*B F Goodrich Co, Akron, Ohio.* For medium-duty drives on pumps and fans; said to be stronger and to have greater flex life than cotton belts.

RETAINING RING DISPENSER — *Truarc Catalog Service, Waldes Kohinoor, Inc, 47-16 Austel Place, Long Island City, NY.* For handling and assembly of Truarc E-retaining rings. Ring-stacked rods fit into base, can be dispatched one at a time.

GRIP RING—*Truarc Catalog Service, Waldes Kohinoor, Inc, 47-16 Austel Place, Long Island City, NY.* Provides positive shoulder secure against thrust and vibration. Diameters at 1/16-in. intervals from ⅛ to ⅜ in. Series 5555.

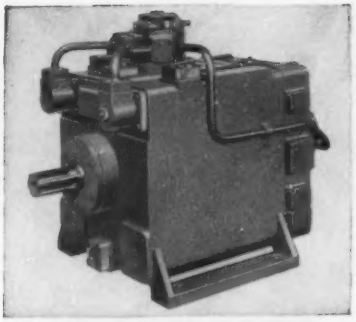
RETAINING RINGS—*Industrial Retaining Ring Co, 8 W Sidney Ave, Mount Vernon, NY.* Carbon spring steel; stacked on metal rods; applicable to 3/32-in.-dia shaft.

O-RING SEALS—*Garlock Packing Co, Palmyra, NY.* For rotary shafts on centrifugal pumps handling mild, corrosive, or hazardous liquids. Type O is an unbalanced seal for pressures up to 200 psi; Type OB, a balanced seal for pressures to 1000 psi.

BACK-UP RINGS—*Garlock Packing Co, Dept 34, Palmyra, NY.* Teflon rings prevent extrusion of O-rings, have high impact strength from —100 to +500 F. Non-corrosive, inert to most chemicals, and self-lubricating.

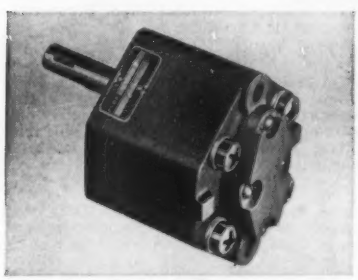
THREAD INSERTS—*Heli-Coil Corp, 1330 Shelter Rock Lane, Danbury, Conn.* For original equipment or thread repair; 47 standard sizes. Made of stainless steel.

CASTERS — *The Fairbanks Co, 393 Lafayette St, New York 3, NY.* Double-race steel swivel casters of welded construction. Outer ball race provides for pressure lubrication. Series 27.



PUMPS AND MOTORS — *Waterbury Tool Div, Vickers Inc, Commercial Hydraulic Dept, Waterbury, Conn.* Positive displacement axial-piston pumps and motors suitable for open and closed hydraulic circuits. Applications include large presses and machine tools, rotary drives, and flying shears. In ten sizes with capacities of 28 to 2300 gpm and 50 to 4000 hp in pressure range of 2000 to 3000 psi.

HYDRAULIC PUMPS—*Vickers, Inc, Div of Sperry Corp, Oakman Blvd, Detroit 32, Mich.* For mobile application where two independent hydraulic pumps are required. Both pumps are vane types, driven by common-shaft in 1-unit housing. Model V-2200 has any combination of 2-, 5-, 8-, or 11-gpm capacities; V-3200 has 2-, 5-, 8-, or 11-gpm at one end and 12-, 15-, 18-, or 24-gpm at other.



HYDRAULIC PUMPS—*Oil Hydraulics Div, Webster Electric Co, Racine, Wis.* For pressure-lubricating, oil-circulating, transfer and filtering systems, and lift and replenishing systems. Capacities are 2.5, 3.5, and 4.5 gpm at 1800 rpm and 100 psi. Series LB.

HYDRAULIC PUMPS—*Oil Hydraulics Div, Webster Electric Co, 1900 Clark St, Racine, Wis.* Gear type. Five sizes have capacities ranging from 10 to 65 gph at 1800 rpm and 100 psi. Handle fuel oils No. 2, 3, 4, or pre-heated No. 5.

GEARPUMP—*Webster Electric Co, Oil Hydraulics Div, 1900 Clark St, Racine, Wis.* Three sizes with capacities ranging from 5.4 to 10 gpm at 1800 rpm and pressure of 1000 psi. Will pump most liquids having substantial oil base.

LOW-PRESSURE PUMPS — *Samuel S Gelber Co, 162 N Clinton St, Chicago, Ill.* Small, hermetically sealed centrifugal pumps for low-pressure, high-volume use. Three sizes handle 180, 350, and 475 gpm. Little Giant.

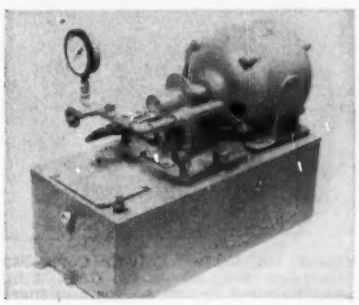
RECIRCULATION PUMP—*Hypro Engineering, Inc, Dept KP, 404 Washington Ave, Minneapolis, Minn.* Designed for production in bronze to meet continuous water-recirculation requirements. Pump delivers 7 gpm at 50-lb pressure and 1750 rpm.

HYDRAULIC PUMPS—*Oil Hydraulic Div, Webster Electric Co, 1900 Clark St, Racine, Wis.* For low-capacity, low-pressure applications; readily adapted to pressure lubricating systems, lift systems, and oil transfer system. Capacities range from 0.25 to 4.5 gpm at 100 psi. Series LA and LB.

PUMP—*Hypro Engineering Inc, 404 N Washington Ave, Minneapolis, Minn.* Impeller has twelve vanes for greater displacement and better priming. Port sizes are ½, ¾, and 1 in.

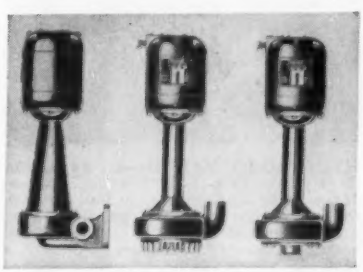
HYDRAULIC PUMP — *Aldrich Pump Co, Allentown, Pa.* Air-powered single- or double-acting models for small-volume capacity at medium and high pressure. Develops up to 20,000 psi operating on 90-psi supply.

SUMP PUMP—*Kenco, Inc, 1125 North Ridge Rd, Lorain, Ohio.* Capacity is 3300 gph at 10-ft head. Redesigned liquid level control switch reportedly gives four times operating life. Model 109.

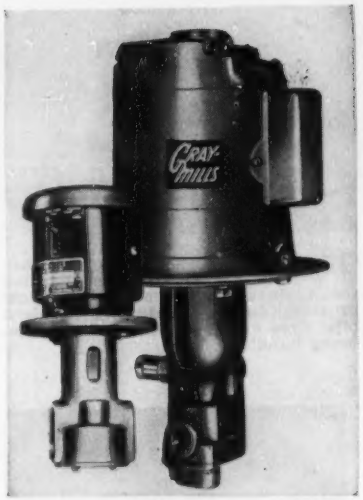


HYDRAULIC PUMPING — *Hackett Brothers, Inc, North Manchester, Ind.* Unit has capacity of 0.8 to 2.8 gpm. Pressures to 1200 psi.

IMPELLER PUMP — *Lee Healey Co, 554 West Garfield, Glendale 4, Calif.* Neovane rubber impeller; cover is tapered and elliptically shaped.



CENTRIFUGAL PUMPS — *Pioneer Pump Div, Detroit Harvester Co, 19657 John R St, Detroit 3, Mich.* Suited for handling liquids polluted with abrasives and other entrained solids. Sizes from 1/20 to 5 hp with different port styles. Larger sizes are rated up to 148 gpm at free flow.

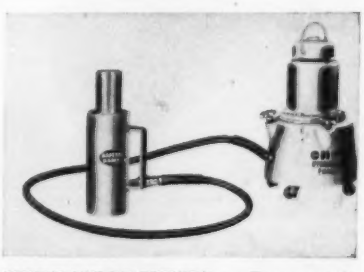


GEARPUMP — *Graymills Corp, Chicago, Ill.* Designed for coolants, oils, solvents, machine tools, and circulating systems. Three sizes deliver 1, 2, or 3 gpm with pressures to 100 psi. Units are self-priming.

HIGH-VACUUM PUMP—*Consolidated Vacuum Corp, Rochester 3, NY.* Ejector diffusion pump designed to produce high pumping speed over pressure range of 0.001 to 0.005 mm of Hg. Removes air at rate of 1200 cfm. Oil diffusion jet and single-stage oil ejector nozzle are combined in compact casing. Type KS-600.

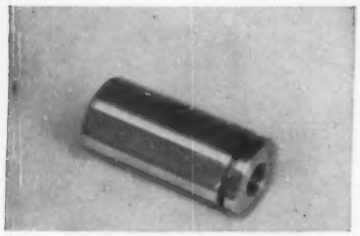
CENTRIFUGAL PUMP — *The F E Myers & Bro Co, 904 S Orange St, Ashland, Ohio.* Develops heads up to 92 ft with capacities to 50 gpm. Sizes of 1/3, ½, ¾, and 1 hp.

PUMPS—*C C Pump Mfg Div, Market-Madison St, Palmyra, NJ.* Deliver exact quantities of wide range of fluids despite change in discharge pressure. Liquids can be delivered in quantities as low as milliliters per hr to as high as 50 gpm against pressures to 20,000 psi.

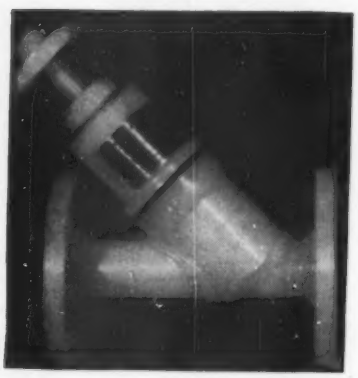


HYDRAULIC PUMPS — *Powermatic, Inc, 1944 E Market St, Akron 5, Ohio.* Operate from shop airline to provide hydraulic pressure from 0 to 12,000 psi. Safety ram designed for pumps is available in 20-, 35-, and 70-ton capacities.

VACUUM PUMP—*F J Stokes Machine Co, 5500 Tabor Rd, Philadelphia 20, Pa.* Improved model has shaft seal, automatic lubrication, new valve stops, and screen filter. Model G.



CHECK VALVE—*Anco, Inc, 1 Baker St, Providence, RI.* Provides positive seal against return flow as well as low pressure drop. Aircraft and standard pipe sizes made to withstand chemical being handled.



PLASTIC VALVES — *Vanton Pump Corp, Empire State Building, New York 1, NY.* Constructed of polyethylene to withstand corrosive action of most acids and caustic solutions. For working pressures to 50 psi and temperatures to 150 F. Both globe and Y valves are available in sizes of ½, 1, 1½, and 2 in.

CONTROL VALVE — *Hydraulic Controls Co, 87 Terrace St, Roxbury 20, Mass.* Mechanically operated for follow-up booster-type positioning systems; flow ranges for pressures up to 3000 psi. Units have linear flow output; supplied threaded or for manifold mounting. Model CO.

SERVO VALVE—*Sanders Associates, Inc, Nashua, NH.* Two-stage, four-way unit with internal mechanical feedback for transformation of low-level electrical information into controlled hydraulic energy. Frequency response is flat fom 0 to 150 cps. Amplification is 5000 with pressures at 3000 psi. Main flow is 12 gpm.

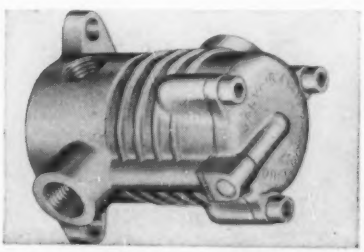
CONTROL VALVE — *Pnew-Trol Devices Inc, 1436 Keating Ave, Chicago, Ill.* For pneumatic, or hydraulic use, provides controlled flow in one direction, full flow in other. Five pipe sizes from ⅛ to ¾ in. in brass, aluminum, steel and stainless; operating pressure to 5000 psi.

FLOW VALVE — *James-Pond-Clark, 2181 E Foothill Blvd, Pasadena, Calif.* Can also be used as automatic drain or dump valve. Designed to allow flow in one direction up to predetermined rate.

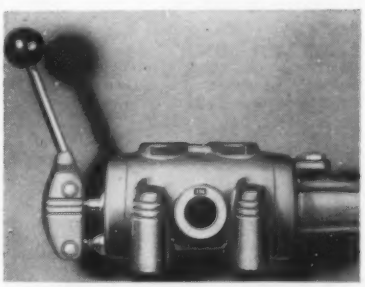
RELIEF VALVE—*Eclipse Fuel Engineering Co, Rockford, Ill.* For regulating pressure on type CF closed-flame gas-oil burners. Five spring sizes permit pressure range from 0 to 500 lb. Four sizes with ⅜- to 1-in. port.

BLEEDER VALVES—*Republic Manufacturing Co, 1930 W 77th St, Cleveland 2, Ohio.* Valve with micrometer-adjustment needle valve in various sizes for 1500 psi is No. 150. Nos. 152 and 153 are for service to 3000 psi at temperatures from —65 to +180 F.

NEEDLE VALVES—*Hoke, Inc, 199 So Dean St, Englewood, NJ.* Made of brass or stainless bar stock in sizes from ⅛ to ½ in. NPT. Both straight line and angle pattern are available.

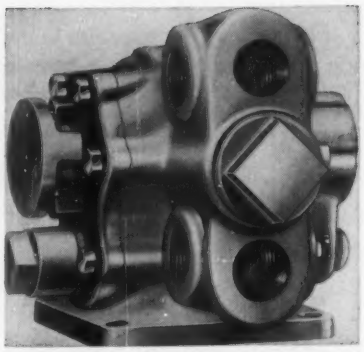


PILOT VALVE — *Valvair Corp, 983 Beardsley Ave, Akron 11, Ohio.* 3 in. high; handles air, oil, water, and inert gases. Models include 2-way and 3-way units, normally open or normally closed. Solenoid-operated. Price: $12.35.



HYDRAULIC VALVE—*Rivett Lathe & Grinder Inc, Brighton 35, Boston, Mass.* Four-way valve has ball detents to hold valve piston in position. Five piston types meet requirements of any hydraulic circuit. Pressure capacity is 1500 psi.

SHUT-OFF VALVE—*North American Mfg Co, 4455 E 71st St, Cleveland 5, Ohio.* Globe-type for use in gas or oil lines with pipe sizes from ¾ through 6 in. Withstands ambient temperature of 167 F and oil heated to 250 F may be passed through valve.



HYDRAULIC VALVES—*A W Cash Co, Decatur, Ill.* Four-way; for positioning double-acting hydraulic cylinders. Design pressures are between 300 and 1500 psi; capacity is 400 gpm at high pressure. Operating fluid viscosity should be equal to that of No. 10 SAE. Type 555-RO.

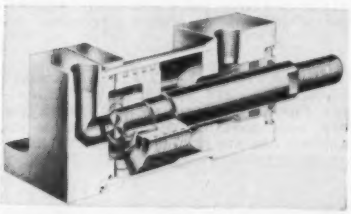
OIL VALVE—*Barksdale Valves, 5125 Alcoa Ave, Los Angeles 58, Calif.* Now available in ranges from ¼- to 1-in. pipe size for 1500-psi application. Straight porting of 4-way series provides for manifolding with standard tees in the pressure and return ports.

BLEEDER VALVES — *Greer Hydraulics, Inc, 354 18th St, Brooklyn 15, NY.* For hydraulic and pneumatic lines of any size or pressure. Valve is spring-loaded rotary type using channeled, knife-edged cap that uncovers port with twist of external head. Bleed outlet port is threaded.

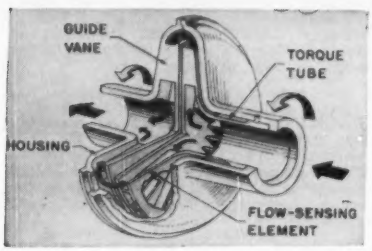
PLASTIC VALVES — *American Agile Corp, Box 168, Bedford, Ohio.* Lightweight 1- and 2-in. agilene polyethylene valves resist hydrofluoric, sulfuric, nitric, and hydrochloric acids at temperatures to 160 F.

HYDRAULIC VALVE—*Skinner Electric Valve Div, Skinner Chuck Co, 137 Belden Ave, Norwalk, Conn.* For automatic operation of single- and double-acting hydraulic cylinders or for pilot control of large 3- and 4-way valves. Handles pressures up to 1000 psi. All internal parts are stainless steel. Model V10-1000.

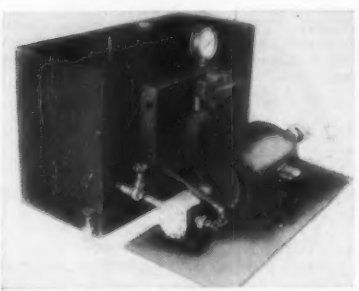
HYDRAULIC CYLINDER — *Carter Controls, Inc, 2912 Bernice Rd, Lansing, Ill.* Meehanite rod bearing provides full surface for longer wear. Entire bearing inset is held by snap ring. Chevron-type packing is said to be easily replaced.



HYDRAULIC CYLINDER — *The S-P Mfg Corp, Cleveland, Ohio.* Cartridge unit, machined from high-leaded bronze alloy, is held by snap ring. Available in 11 bore sizes with rating of 2000 psi. JIC standards.

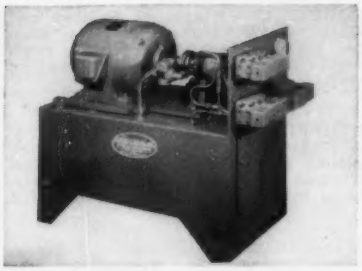


CONTROL FLOWMETER — *Control Engineering Corp, Norwood 80, Mass.* Measures true mass rate of flow; totally insensitive to volume. Direct reading in.-lb per min.

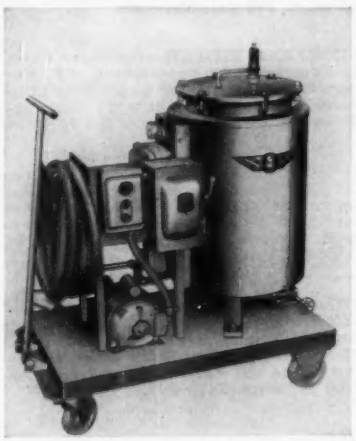


POWER PACK — *Clifton Hydraulic Press Co, 288 Allwood Rd, Clifton, NJ.* Capacities from 5 to 50 gpm on lp side and ½ to 6 gpm on hp side; pressure to 10,000 psi. Solenoid-controlled operating valve is optional equipment.

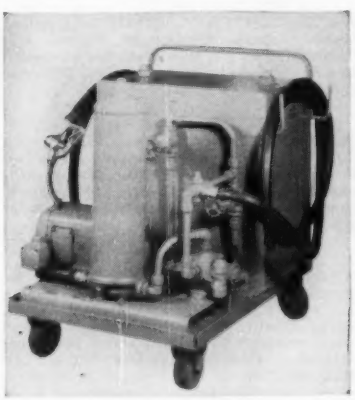
PORTABLE COOLANT UNIT—*Shellback Manufacturing Co, 11833 Hamilton, Detroit 3, Mich.* For machines without built-in coolant pump; pumps 12 gpm against 4-ft head. Price: $62.50.



POWER UNIT—*J N Fauver Co, Inc, 49 W Hancock, Detroit, Mich.* Consists of 12-gpm hydraulic pump, 7½-hp motor, relief valve, and three panel-mounted solenoid-operated four-way control valve.



CARTRIDGE FILTER — *Industrial Filtration Div, US Hoffman Machinery Corp, 219 Lamson St, Syracuse, NY.* For periodic filtration of hydraulic and quench oils. Unit has flexible hose with quick-connecting couplings which permit hooking to oil supply of machine without interrupting its operation. Mounted on dolly for portability.



HYDRAULIC FILTER UNITS—*J N Fauver Co, Inc, 49 W Hancock, Detroit 1, Mich.* Pump oil from machine through filter and back; portable; 55- and 20-gal. sections.

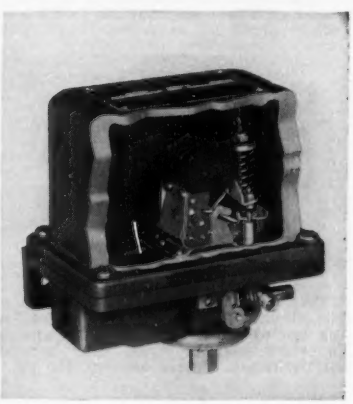
PRESSURE FILTER—*Ogden Filter Co, 4214 Santa Monica Boulevard, Los Angeles, Calif.* For chemicals, electroplating solutions, and oils; eliminates cloths, papers, screens, and pads.

FILTERS—*Titeflex, Inc, 500 Frelinghuysen Ave, Newark 5, NJ.* Motor and pump are located in front of precoat tank and filter chamber. Floor area is 12 sq ft. Model IA-18-20.

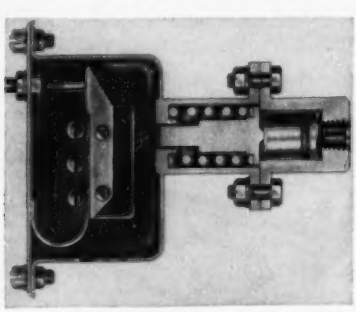
MICRONIC FILTER—*Rucker Manufacturing Co, 4516 Hollis St, Oakland 8, Calif.* For mounting within oil tank; shut-off valve permits replacement without draining tank. High flow rate; minimum pressure drop.

HYDRAULIC CYLINDERS — *Hydro-Line Mfg Co, 725 19th St, Rockford, Ill.* Bore sizes to 10-in. dia; working pressures 2000 tsi. All steel bodies, bored barrels, hardened piston rods, rod scrapers, and cartridge-type packings. Series J.

TUBE FITTINGS—*Crawford Fitting Co, 884 E 140th St, Cleveland, Ohio.* Two fittings in variety of sizes: caps for capping end of tube; plugs for plugging unused port of fitting.



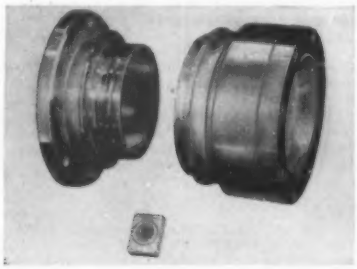
PRESSURE SWITCH — *Square D Co, 4041 N Richards St, Milwaukee 12, Wis.* For water pumps and air compressors where explosive atmospheres are present. Pump switch has pressure range of 20 to 80 psi; compressor unit has range of 40 to 200 psi.



PRESSURE SWITCH — *Barksdale Valves, 5125 Alcoa Ave, Los Angeles 58, Calif.* Senses any pressure from 15 to 3000 psi and actuates electrical circuit. May be mounted in any position and is insensitive to line surges. Model 9612.

PARTS and MATERIALS—hydraulic

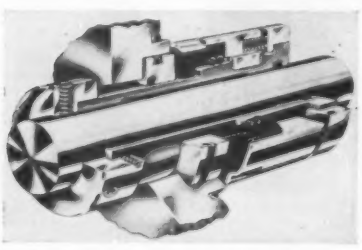
COUPLING—*Aeroquip Corp, Jackson, Mich.* Connects and disconnects fluid-carrying lines by push-pull action. When disconnected, each half forms perfect seal.



COUPLERS — *Snap-Tite, Inc, Union City, Pa.* Standard flange connections for 8-in. pipeline. Connection is made by sliding sleeve on coupler.

PIPE FITTING—*Haloal Mfg Corp, Box 95, Bellerose 26, NY.* Cast-iron fitting encloses pipe leak within captive Neoprene gaskets when four screws are tightened. Tested safe at 150 psi.

TUBE FITTINGS — *Crawford Fitting Co, 884 E 140th St, Cleveland 10, Ohio.* Fractional sizes for holding thermocouples. Available in brass, aluminum, steel, stainless, and monel in sizes from ⅛ in. up.



MECHANICAL SEAL — *The Crane Packing Co, Dept A-18, 1800 West Cuyler Ave, Chicago 13, Ill.* Compactly designed for use in conventional pump stuffing boxes. Withstands pressure of 1000 psi. Type 8-B.

COUPLER — *Minnesota Rubber and Gasket Co, Minneapolis 16, Minn.* Rubber sealing ring bonded inside overcomes difficulty in welding or threading stainless-steel piping. Quikupl.

STUFFING-BOX SEALS—*Sealol Corp, 45 Willard Ave, Providence 5, RI.* Completely pre-assembled for installation. Control of hydraulic balance maintains minimum face loads. Model SB.

HYDRAULIC COUPLING — *Eastman Manufacturing Co, Manitowoc, Wis.* Said to be leakproof at pressures up to 5000 psi with hose as large as 1 or 1¼ in.

MECHANICAL SEAL—*Crane Packing Co, 1800 Cuyler Ave, Chicago, Ill.* For small pumps, hot-water circulators, and other rotary-shaft applications. Temperatures from —100 to +450 F; pressures to 200 psi. Type 19.

PIPE-LINE FILTER—*Dollinger Corp, 11 Centre Park, Rochester 3, NY.* For installations requiring 40-psi max pressure. 1-bolt accessibility for cleaning; dia is 3½ in. and length is 6½ or 10 in.

HIGH-PRESSURE FILTERS — *Cuno Engineering Corp, Meriden, Conn.* For operating pressures to 1000 psi. Construction is all-welded steel. Guaranteed degrees of filtration are 10, 25, 50, and 75 microns.

OIL-CIRCUIT RECLOSER — *General Electric Co, Schenectady, NY.* Time-current characteristic allows interchangeability with other makes. Features one-way seal. Ratings are 70, 100, and 140 amp. Type FR.

HYDRAULIC FLUID—*E F Houghton & Co, Philadelphia, Pa.* Non-flammable; can be used at 1000 psi. Viscosity index is 150. Claimed to carry 2½ times load of conventional hydraulic oils of similar viscosity.

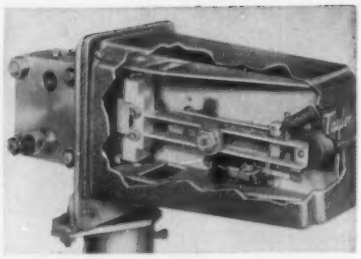
FOG NOZZLES—*Bete Fog Nozzle Inc, Greenfield, Mass.* Form fine fog by shearing continuous film of liquid from solid jet. Flow rates from 1 to 1000 gpm.

WATER-SUCTION HOSE — *Quaker Rubber Corp, Div H K Porter Co, Philadelphia, Pa.* Designed for pressure and suction handling of water. ID sizes range from 1¼ to 3 in.

TUBING INSERT—*Crawford Fitting Co, 884 E 140th St, Cleveland 10, Ohio.* For use with flexible Tygon plastic tubing and leakproof Swagelok fittings. Inserts available in any metal with sizes from 3/16 in.

HYDRAULIC CONTROL HOSE — *Quaker Rubber Corp, Div H K Porter Co, 1932 Oliver Bldg., Pittsburgh, Pa.* Reinforced with high-tensile steel wire; withstands pressure to 5000 psi; retains flexibility to —40 F. Sizes from 3/16 to 2 in.

TUBING—*Flexible Tubing Corp, Guilford, Conn.* Made of rust-resistant wire helix covered with woven fabric coated with resinous compound. Lengths of 50 ft with diameters from 1 to 2½ in.



TRANSMITTER—*Taylor Instrument Companies, Rochester 1, NY.* For installations requiring differential pressure measurement and transmission. Converts differential into equivalent output of 3 to 15 psi. Over-range protection of 1500 psi in either direction.

PNEUMATIC EJECTOR — *Yeomans Brothers Co, 999 North Ruby St, Melrose Park, Ill.* Handles any fluid; has only one moving part. Operates on existing air supply, separate compressor, or auxiliary apparatus.

LIQUID-LEVEL CONTROL—*Haledy Electronics Co, 57 William St, New York 5, NY.* Electronic; all tubes have cold cathodes. Accuracy is independent of temperature and pressure.

HIGH-PRESSURE HOSE — *Republic Rubber Div, Lee Rubber & Tire Corp, Youngstown 1, Ohio.* Designed not to weaken under constant vibration or flexing. Carries gases or fluids under high or low pressure.

PACKING COMPOUNDS — *Surveys, Inc, 219 Euclid Ave, Trenton, NJ.* For valves, pumps, and expansion joints. Pure copper flakes are dispersed throughout body of stick. Designed for steam, hot water, vacuum, or pressure applications.

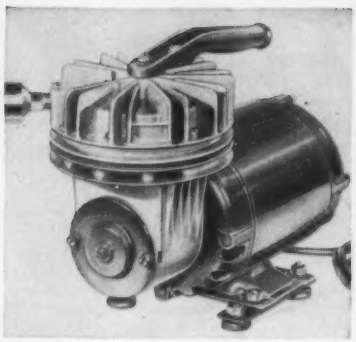
PACKING—*Flexrock Co, 3600-A Filbert St, Philadelphia 4, Pa.* For high-speed centrifugal acid pumps; asbestos yarn is braided over twisted core of glass fiber—both Teflon treated.

HOSE FITTING — *Aeroquip Corp, Jackson, Mich.* Clamps only reinforcing braid of hose to effect fluid-tight seal.

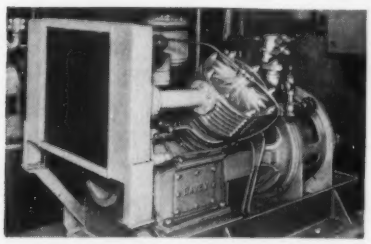
SEAL RINGS—*Victor Manufacturing & Gasket Co, PO Box 1333, Chicago 90, Ill.* Made of Victoprene synthetic rubber compound; for moving or non-moving seals. 87 stock sizes from ⅛x¼x1/16 to 15½x16x¼ in.

LIQUID-FEEDING DEVICE—*Hankison Corp, 117 Biltmore Bldg, 951 Banksville Rd, Pittsburgh 16, Pa.* Gravity-type; maintains constant rate of feed adjusted by valve. Feed can be varied from ½ pt a day to 500 gal a day. Made in any size desired; constructed of materials to suit specific fluids.

ACCUMULATOR—*Harris & Stevenson, 1003 Main St, East Greenwich, RI.* Hydraulic accumulator uses hard-shell ball bonded with synthetic compound. Cylinder diameters from 1 to 8 in.

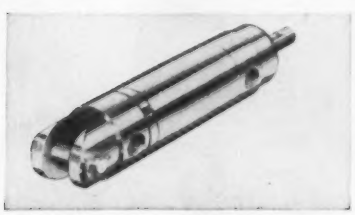


AIR COMPRESSOR—*Modernair Corp, San Leandro, Calif.* Max operating pressure is 100 psi; provides continuous volume to 3.5 cfm. Does not require tank—air devices can be furnished with pressure at production station without running piping.



COMPRESSOR — *Davey Compressor Co, Kent, Ohio.* Stationary 25-hp unit has displacement of 128 cfm. Standard equipment includes intercooler with safety valve. Model 25D.

COMPRESSOR — *DeVilbiss Co, 300 Phillips Ave, Toledo 1, Ohio.* Equipped with valve-spring arrangement which increases speed. V-type.



AIR CYLINDERS—*Tomkins-Johnson Co, Jackson, Mich.* Eliminate tie rods and feature automatic valve action for fast return stroke. Port positions may be rotated without disassembly.

AIR CYLINDER—*Air-Mite, Chicago, Ill. Small* unit has one-in. stroke, and delivers 75-lb thrust on 100-lb line. Price: $5.95.

AIR CYLINDER — *Modernair Corp, San Leandro, Calif.* For vertical or horizontal mounting. Bore is 1⅛ in.; stroke 1 or 2 in.

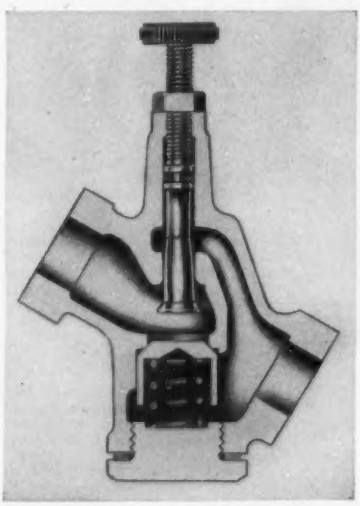
AIR CYLINDERS—*Mead Specialties Co, Dept CV-4, 4114 N Knox Ave, Chicago, Ill.* Air clamps have pf seven times line pressure and 3-in. bore with stroke of 1, 2, or 3 in.

CYLINDER POSITIONER—*The Foxboro Co, Foxboro, Mass.* Applies a high-pressure, pneumatic differential across a cylinder piston to produce position demanded by controller. Responds to change in signal pressure of 0.25% of range and positions a piston within 1% of total stroke. Operates from standard 3-15 psi signal; connections are ¼-in. NPT. Poweractor.

PNEUMATIC CYLINDERS — *Carter Controls, Inc, 2800 Bernice Rd, Lansing, Ill.* Cartridge rod bearing reduces wear caused by misalignment in key-type pneumatic cylinder. Bore sizes 1½ to 8 in.

VALVES—*Versa Products Co, Inc, 249 Scholes St, Brooklyn, NY.* Pneumatic and hydraulic; ⅜ and ½ NPT size now added to ⅛ and ¼ size; two-, three-, and four-way types use hand, cam, pilot, or foot actuating devices with or without spring return. Operating pressures are 0 to 200 psi.

AIR VALVE — *Airmatic Valve Inc, 7317 Associate Ave, Cleveland, Ohio.* Enables operation of two or more cylinders in correct sequence. Uses air-, oil-, or water-pressue from 20 to 200 psi; six pipe sizes from ¼ to 1¼ in.



CONTROL VALVE—*Ross Operating Valve Co, 120 East Golden Gate, Detroit 3, Mich.* Can be mounted in any position between operating valve and cylinder end to control airflow. Available with ¼, ⅜, ½, ¾, 1, and 1¼ ipt.

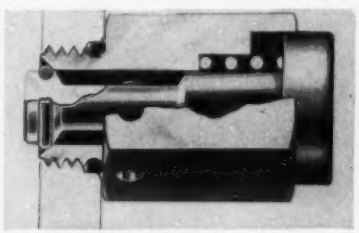
PRESS AIR VALVES—*Hannifin Corp, 1118 S Kilbourn Ave, Chicago 24, Ill.* Air control valve for mechanical presses controlled by air-operated clutches and brakes. Unit is dual valve and cannot fail other than safe unless pilot sections or valves develop identical trouble on same stroke. Capable of speeds in excess of 600 cycles per min.

SOLENOID-OPERATED VALVES — *Hannifin Corp, 1118 S Kilbourn Ave, Chicago 24, Ill.* Principal use is for electrical control of double-acting air cylinders on short-stroke high-speed applications. Recommended for speeds to 600 cpm. Model CC1-25 has a single solenoid and valve stem is spring-returned; model CC11-25 has two solenoids.

RELIEF VALVE — *Anco, Inc, One Baker St, Providence, RI.* Relieves excessive pressure to predetermine setting. Available in aircraft and standard pipe sizes.

INSTRUMENT VALVE—*The Imperial Brass Mfg Co, 1200 W Harrison St, Chicago 7, Ill.* Packless shut-off valve, with solid Teflon diaphragm, for vacuum applications. Temperature range is —100 F to +450 F. Available with 45° flair or solder connections.

RELIEF VALVE—*Pantex Manufacturing Co, Hydraulics Div, Pawtucket, RI.* Maintains constant relief pressure despite varying back pressure. Cartridge type.

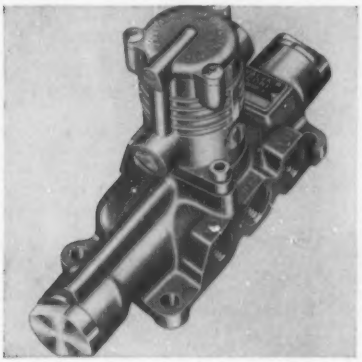


RELEASE VALVE — *James-Pond-Clark, 2181 E Foothill Blvd, Pasadena 8, Calif.* Manually operated; eliminates hazard of not turning off petcock-type valve.

RELIEF VALVES — *James-Pond-Clark, 2181 Foothill Blvd, Pasadena 8, Calif.* Designed for use in lightweight, hermetically-sealed containers used for shipping delicate electronic instruments. Can also be used as vacuum breakers or breather valves.

RELIEF VALVES — *James-Pond-Clark, 2181 E Foothill Blvd, Pasadena 8, Calif.* Use O-Ring that is self-aligning between two conical seats of a poppet valve. Pressures from 2 to 45 psi. Series 5400.

PARTS and MATERIALS—pneumatic



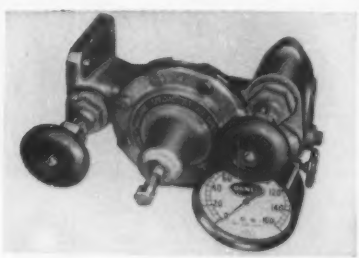
SOLENOID VALVES—*Valvair Corp, Akron 11, Ohio.* Pilot-operated air control valves for three- and four-way applications in pipe sizes from ¼ to 1 in. All parts are non-corrosive; units meet JIC specifications. Max power consumption is 10 w; for supply from 35 to 150 psi.

CONTROL VALVE — *Valvair Corp, Akron, Ohio.* For controlling stroke of air cylinder; ⅜-in. pipe size, four-way piped-exhaust model.

RELEASE VALVE—*Deublin Co, 1155 Waukegan Rd, Glenview, Ill.* Handles air pressure from 0 to 250 psi on pneumatic clutches up to 1500 hp.

FOOT VALVE—*Air Fixtures, Inc, Dept 87, North Manchester, Ind.* Designed for optimum comfort. Ports are ¼ in. Operates on airlines up to 100 psi. Price: $14.75.

FOUR-WAY VALVE — *Galland-Henning Mfg Co, Nopak Div, Milwaukee 46, Wis.* Can be pilot-operated by cam, hand- or foot-control poppets, or by solenoid. Type R has slide valve linked to balanced piston, type AR to unbalanced piston. R is available in pipe sizes from ¼ to 1 in., AR, ¼ to ½ in.



MANIFOLD VALVE—*Danly Machine Specialties, Inc, 2100 S Laramie Ave, Chicago 50, Ill.* Contains pressure regulator, accessory valves, pressure gage, and fittings. Shut-off valve is globe-type. Assembly measures 10 in. from inlet to outlet. Available in 2-, 4-, 6-, and 8-station units.

AIR VALVE—*Mechanical Air Controls, Inc, 15311 W 11 Mile Rd, Detroit 37, Mich.* Solenoid-operated; sealing material is integrally bonded to aluminum alloy surface-hardened spool. Bores of body and retainers are bearing-ized.

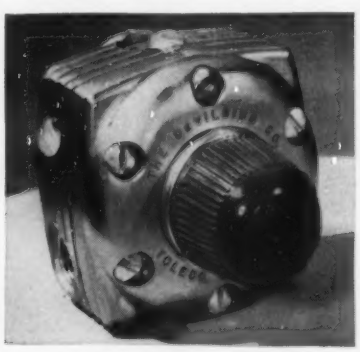
VALVE TIMER—*Mead Specialties Co, Inc, 15 S Market St, Chicago 41, Ill.* Electro-pneumatic unit operates 12-single acting or 6-double acting cylinders in any desired sequence with required cycle-time set up by change gears.

PRESSURE CONTROL UNIT — *Emmett Machine & Manufacturing, Inc, 2249 Fourteenth St, SW, Akron, Ohio.* Consists of diaphragm valve in free-flow pattern and control unit which can reportedly be dismantled, cleaned, and reassembled in two min. 300-lb valve in standard or V-port assembly. Type E296.

AIR-WEIGHT CONTROL — *Askania Regulator Co, 240 East Ontario St, Chicago 11, Ill.* Applications to control of mixers, grinders, or polishers. Regulator is equipped with special power-responsive signal system. Unit measures three-phase power, puts out high-level hydraulic signal in proportion to deviation from preset power level. Used with conventional instrument transformers.

PNEUMATIC CONTROL — *Graham Transmissions, Inc, Menomonee Falls, Wis.* For use with Graham variable-speed transmission; sensing element may be controlled by such variables as flow rate, pressure, ph, temperature, or humidity. Zero speed is obtained at 3 psi and any desired max at 15 psi.

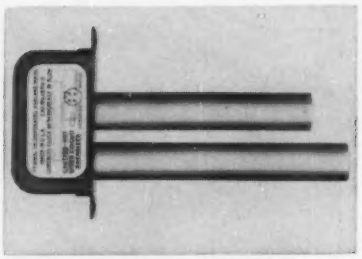
FLOW-CONTROL UNIT—*The Denison Engineering Co, 1160 Dublin Rd, Columbus 16, Ohio.* For metering or controlling oil flow. Operating pressures to 3000 psi; 2- and 3-port types in sizes of ¼, ⅜, and ¾ in.



AIR REGULATOR — *The DeVilbiss Co, 300 Phillips Ave, Toledo 1, Ohio.* Capacity of 80 cfm at 100-lb line pressure. Uses air pressure against regulating diaphragm. Max pressure which can be regulated is 135 psi. Price: $19.30.

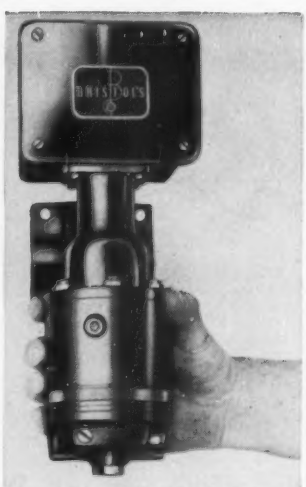
FLOW METER—*Waukee Engineering Co, Milwaukee, Wis.* Built-in valve model of standard Flo-meter in 11 different sizes. Valves are located at top of meter.

PRESSURE REGULATOR—*The Aro Equipment Corp, Bryan, Ohio.* Claimed to be ½ weight and ¼ size of comparable regulators. Max inlet pressure is 2000 psi and output pressure is adjustable from 50 to 300 psi. Model 10700.



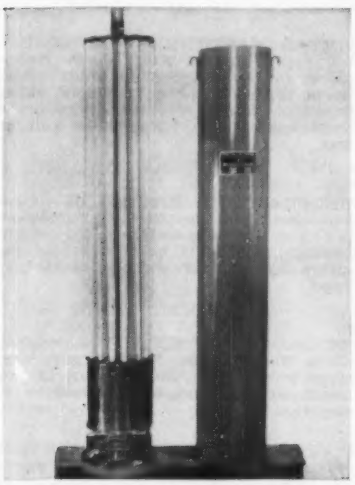
AIRFLOW CONTROL — *Fenwal Inc, Ashland, Mass.* Maintains flow rate and may also be used as liquid-level detector. Responds to change of 0.1 in. in level; response to flow of air can be set from 1000 to 50,000 lb per hr per sq ft. Does not depend on pressure drop—one leg is heated and as flow rate drops, this leg expands and transmits action to electric contact assembly.

PRESSURE REGULATOR—*C A Norgren Co, 3436 S Elati St, Englewood, Colo.* Pilot-controlled; designed for precision air control from 2 to 120 psi with capacity of 200 cfm. Sizes of ½, ¾, and 1 in.



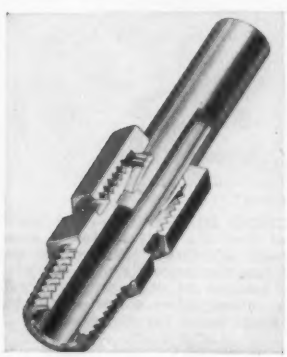
PNEUMATIC TRANSMITTER — *The Bristol Co, Waterbury 20, Conn.* For measuring and transmitting readings of temperature, pressure, vacuum, differential pressue, and liquid level to recording, indicating, and controlling receivers. Transmission pressures are between 3 and 15 psi.

FILTER LUBRICATOR — *Air-Speed Tool Co, 1502 W Slauson Ave, Los Angeles 47, Calif.* Lubricates pneumatic tools; has fittings adaptable to all standard-size airlines. Oil flow can be controlled by needle-point adjustment.



COMPRESSED AIR FILTER — *Hankison Corp, 117 Biltmore Bldg, 951 Banksville Rd, Pittsburgh, Pa.* Disposable filter cartridge provides 24 sq ft of filtering area; condensing unit has 950 sq in. of surface area. Accumulated condensate is discharged through trap valve designed to prevent pressure loss.

CONDENSER FILTER — *Hankison Corp, 117 Biltmore Bldg, 951 Banksville Road, Pittsburgh 16, Pa.* Provides compressed air of instrument quality by dehydrating and filtering ordinary plant air. Model B-30-D.



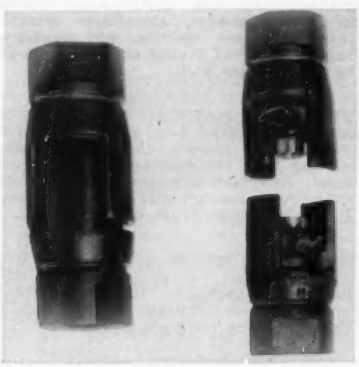
TUBE FITTINGS—*Weatherhead Co, 300 E 131st St, Cleveland 8, Ohio.* Consist of sleeve, nut, and tapered body to form positive seal without threading or welding. Available in carbon or stainless steel.

TUBING—*Superior Tube Co, 1540 Germantown Ave, Norristown, Pa.* Seamless light wall, available in sizes to max OD of 2-1/16 in. Available in stainless or monel; 3 tempers—half-hard drawn, full-hard drawn, and fully annealed.

TUBE AND REDUCER—*The Parker Appliance Co, Cleveland, Ohio.* Converts any Ferulok fitting into combination size unit, permitting connection to smaller size tube.

MUFFLER — *Vulcan Tool Co, 730 Lorain Ave, Dayton, Ohio.* Reduces noise caused by air discharge in high-speed air-operated spindles. Exhaust energy is dissipated through hundreds of small openings.

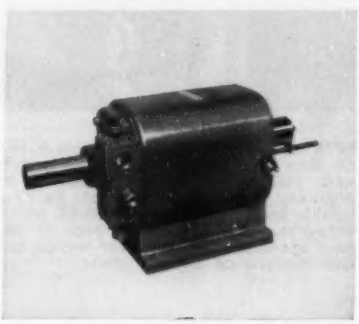
AIRLINE FILTERS—*Air-Line Engineering Co, 198 Wayne St, Mansfield, Ohio.* Remove water and oil from compressed air lines. Tested for 500 psi. Inner cartridge has removable perforated bottom disk and is packed with Fiberglas.



AIR HOSE COUPLING — *Twinmatic Corp, 2246 South Barrington Ave, Los Angeles 64, Calif.* Identical valves in each end prevent airflow when coupling is broken. Valves and seats are brass, coupling bodies aluminum.

AIR CARTRIDGE—*Pratt & Whitney, Div Niles-Bement-Pond Co, West Hartford 1, Conn.* For use with Air-O-Limit gages; applied in single- or multiple-station fixture gages. Available in three magnification ranges operating on total scales of 0.010, 0.015, and 0.020 in.

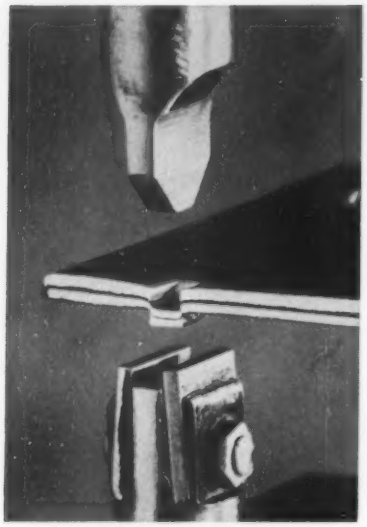
PRESSURE JOINT — *ANCO, Inc, 1 Baker St, Providence, RI.* Conveys steam to 350 psi and liquids to 3500 psi while rotating at high speeds. Withstands temperatures from —100 to +600 F. Pipe sizes from ¼ to 5 in.



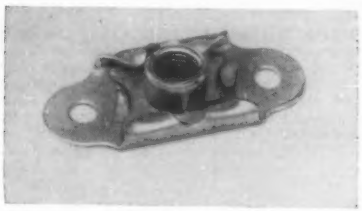
IMPACT HAMMER HEAD — *Air-Hydraulics, Inc, 248 Belden Rd, Jackson, Mich.* Unit is operated at 100 psi and credited with 50 strokes per cu ft or air at a rate of 60 spm when operated by hand or foot control, 120 spm when actuated by solenoid valve. Capacity is 12,000 lb; recommended stroke is 3 in.

AIR MOTORS—*Keller Tool Co, Grand Haven, Mich.* Rated from ½ to 2¾ hp in 12 combinations of speed and torque. Air consumption varies from 21 to 83 cfm.

BLOW GUN—*Aro Equipment Corp, Bryan, Ohio.* Throttle valve meters air pressure with fingertip control; air can be regulated from whisper to blast or set for fixed pressure.



METALACING—*Crockett Engineering Co, San Francisco, Calif.* Special punch and yieldable die are inserted in ordinary punch press to create parallel double incision in two sheets of metal being fastened together. Force of impact spreads metal to form wedge under surface of bottom sheet.



ANCHOR NUT—*The Kaynar Co, 820 E 16th St, Los Angeles, Calif.* Two-lug floating anchor nuts, tap sizes of 10-32 and ¼-28. First has torque-out value of 80 in.-lb; second of 120 in.-lb. Series F-5000.

FLANGE NUTS—*Reid Tool Supply Co, 709 Baker St, Muskegon Heights, Mich.* Made of low carbon steel, case hardened and zinc plated. Nine sizes range from ¼ to 1 in.

LOCKING SYSTEM—*Fasteners, Inc, One W 47 St, New York 36, NY.* For such threaded fasteners as inserts and studs. Uses key ring for positive locking against rotation. Two keys mate with keyway in stud.

NUT HOLDER—*E H Stay Co, 351 Atlantic Blvd, Los Angeles, Calif.* Holds anchor nut plates in alignment during riveting. Holder is a short bolt of 1020 steel threaded at one end with a nut on the other end and hollow tubing between.

LOCKNUT — *Security Locknut Corp, North Ave & 15th Ave, Melrose Park, Ill.* For use where corrosive elements are present; can be hot-dipped galvanized; incorporated locking insert. Sizes from ⅜ to 1⅜ in.

TEE NUTS — *Jergens Tool Specialty Co, 712 E 163rd St, Cleveland, Ohio.* Throat sizes from 7/16 to 1⅛ in.; machined of heat-treated alloy steel with tensile strength of 200,000 psi.

ACORN NUTS—*Reid Tool Supply Co, 709 Baker St, Muskegon Heights, Mich.* For construction of jigs and fixtures; made from hexagon cold-finish steel; variety of sizes.

SPIN-DOWN LOCKNUT — *Thompson-Bremer & Co, 520 N Dearborn St, Chicago 10, Ill.* Applies permanent vibration-proof grip only after nut contacts work. At contact point, ¼ turn takes up all play. Six threaded tines bite into bolt with shrinking action. Sizes of 8- 1- and ¼ in.

SHIELDED NUT—*Shakeproof Division, Illinois Tool Works, St Charles Rd, Elgin, Ill.* For use with automatic automobile seats; variation of standard J-type with flap curving over screw point.

BARREL NUT—*Shur-Lok Corp, 9010 Bellanca Ave, Los Angeles 45, Calif.* Self-aligning and self-locking. Made in three pieces: aluminum barrel, threaded steel bushing, and steel retainer. Internal thread sizes from ¼-28 to ⅞-14. Series SL6.

FLOATING BARREL NUT — *A A Metal Products, Inc, 6800 S Central Ave, Los Angeles 1, Calif.* Eliminates milling large recesses for wrench clearance. Anodized aluminum alloy body with cadmium-plated steel retainer. Bolt sizes range from ¼-28 to 1½-12.

SOCKET SCREWS — *The Allen Mfg Co, Hartford, Conn.* Designed for smoother surfaces in applications where countersinking is impossible. Standard size range is available.

SELF-LOCKING SCREWS — *Continental Screw Co, JACO Devices, Inc, New Bedford, Mass.* Nylon insert conforms to curvature of screw threads and provides positive locking action. Depth of hole for nylon plug has been reduced.

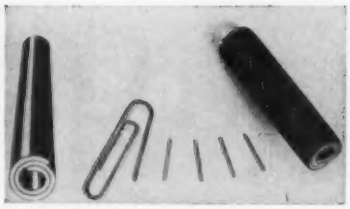
SETSCREW—*Set Screw & Manufacturing Co, 13 Main St, Bartlett, Ill.* Cup point design for increased holding power with same setting torque. Slotted, headless, and slabbed type.

WASHERS—*Reid Tool Supply Co, 709 Baker St, Muskegon Heights, Mich.* Two piece, spherical, for use in construction of jigs. Carbon-steel, case-hardened; zinc-plated.

C WASHERS—*Reid Tool Supply Co, 709 Baker St, Muskegon Heights, Mich.* Nine sizes ranging from ¼- to 1-in. dia.

BLIND RIVET—*Huck Manufacturing Co, 2480 Bellevue Ave, Detroit 7, Mich.* 3/32-in.-dia pull-through type with nickel-plated brass sleeve. Hand tool for driving rivets is priced at $16.73.

RIVET—*J C Rhodes & Co, Branch of United Shoe Machinery Corp, New Bedford, Mass.* Fastener consists of rivet and inserted mandrel. Fastening tools can be operated manually or pneumatically. Driving rate is reportedly as high as 1200 per hr.



FASTENERS—*C E M Co, 24 School St, Danielson, Conn.* Pin fasteners have flexible coils that provide radial spring action when compressed into hole. Sizes range from 1/32- to ⅛-in. dia with lengths from ⅛ to 4 in.

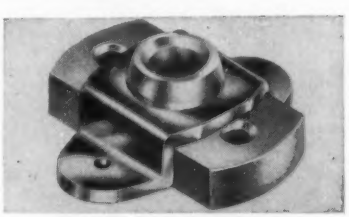
METAL FASTENERS — *Wedgelock Co, 5446 Satsuma Ave, North Hollywood, Calif.* Temporarily holds metal parts, with drilled or punched holes, together under pressure. Combined thickness of material must be 4 in. or less.

SELF-LOCKING FASTENER — *Dzus Fastener Co, Inc, Box 185, Babylon, NY.* For securing water- and gas-tight casings. Casing is held in sealed position by pair of springs carried in head.

PUSH-ON FASTENER — *Prestole Corp, Toledo, Ohio.* Non-slip grip bites deep into plastic, metal, fiber, or polished and ground studs, straight or tapered.

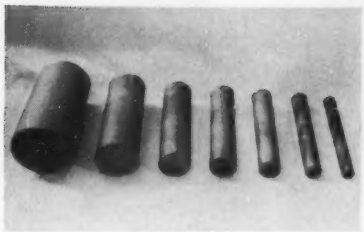
THREADED STUD — *Newton Insert Co, 1321 E 17th St, Los Angeles 21, Calif.* For installation in metal or plastic; available in cadmium-plated alloy steels, stainless steel or special alloys. Has knurled head and is fitted with pressure ring.

STUDS—*Driv-Lok Pin Co, 715 Chauncey St, Sycamore, Ill.* For speeding attachment of light metal or plastic parts to heavier structural members. Various head styles in lengths from ¼ to 1 in. and dia from 0.067 to 0.250 in.



ANCHOR BUSHINGS—*The Hi-Shear Rivet Tool Co, 8924 Bellanca Ave, Los Angeles 45, Calif.* Nut plate anchor bushings for use on drill templets provide means of locating and drilling three coordinated screw and rivet attachment holes for nut plates.

BELT-JOINING—*Louis Levin & Son, 728 E Pico Blvd, Los Angeles, Calif.* Device tapers and cements belt ends in less than 2 min. Useful for machines which cannot be disassembled to insert endless belt.



IRON BAR STOCK—*Howard Foundry Co, 1700 N Kostner Ave, Chicago 39, Ill.* Said to pass X-ray inspection for uniform density. Supplied in 12-in. lengths with dia from 1¼ to 6 in. Brinell hardness is 245.

SCREW STEEL — *Jones & Laughlin Steel Corp, Gateway Center, Pittsburgh, Pa.* Free-machining steel for making screws, nuts, and bolts is furnished in the form of cold-finished bars. Produced by open-hearth process.

STEEL FILTER SHEET — *Micro Metallic Corp, 35 Sea Cliff Ave, Glen Cove, NY.* Standard sheet has 0.040-in. thickness with mean pore opening of 10 microns. Thickness tolerances are maintained to ±0.002 in. Tensile strength is 25,000 psi. Grade X.

TOOL STEEL BARS—*Crucible Steel Co of America, 405 Lexington Ave, New York 17, NY.* Hollow bars in sizes from 2-in. round with 1-in. hole to 16-in. round with 12-in. hole. Three types of steel: air-hardening, oil-hardening, and water-hardening.

COPPER-CLAD STEEL — *Metals & Controls Corp, General Plate Div, Attleboro, Mass.* Hardenable spring material available as 10/80/10 or 80/20 in widths to 8 in. and thicknesses of 0.050 in. or less.

STAINLESS STEEL—*The Cooper Alloy Foundry Co, Hillside, NJ.* Hardenable 18-8 type containing copper, molybdenum, silicon, and beryllium. Said to be readily machinable in quench-annealed state and easily welded in annealed condition. Major advantages said to be non-galling and corrosion-resistant properties. Type V2B.

TOOL STEEL — *Firth Sterling, 3113* Forbes St, Pittsburgh 30, Pa. Said to combine toughness with great abrasion resistance. Hardness is 84 Rc. Method is said to result in formation of greatest possible amount of vanadium carbide. Firth VC.

STAINLESS ALTERNATE — *Allegheny Ludlum Steel Corp, Pittsburgh 22, Pa.* Austenitic alternate for 18-8 is said to have high ductility and good weldability. Available in strip and most other forms .

IRON-POWDER METAL — *Chrysler Corp, Amplex Div, Detroit, Mich.* Highly ductile material withstands 70,000 psi. Can be used for finished machine parts such as gears, cams, brackets, and lever arms. Steel Oilite.

ALUMINUM PLATE — *Pioneer Tool Engineering, Inc, El Segundo, Calif.* Developed to cut cost of making jigs, mill fixtures, and dies. Lengths of 96 and 144 in. with 48-in. widths. Formula 921-T.

ALUMINUM MESH — *British Industries Corp, 164 Duane St, New York, NY.* For machinery guards, air-filters, and electrical screen. Available in 12 meshes.

ALUMINUM-BRONZE STRIPS—*The Ohio Knife Co, Dreman Ave, Cincinnati 23, Ohio.* Wearing strip surface is aluminum bronze, welded to a soft steel base, and readily machinable. Surfaces are ground to close tolerances.

ALUMINUM PLATES, BARS — *Reynolds Metals Co, 2500 S Third St, Louisville, Ky.* For tool and die use; especially suitable for construction of hydro-press form blocks, hydro-stretch form dies, jigs, and fixtures. Surface finish is 32 mu-in.; flatness ±0.005 in.

ALUMINUM STRIP — *Scovill Manufacturing Co, Waterbury, Conn.* Cold-rolled; said to have drawing qualities of Scovill continuous-cast brass strip. Produced in controlled atmosphere with substitution of nitrogen for oxygen.

TWIST DRILL BLANKS — *General Electric Co. Carboloy Dept, Detroit Mich.* Cemented carbide. Reduced thickness allows design of more steel backing for each tip.

CUTTING-TOOL MATERIAL—*Carboloy Dept, General Electric Co, Detroit 32, Mich.* Cemented carbide specially suited to heavy steel-cutting operations. Claimed to step up production by 30% with 50% longer life. Will stand up under heavy cutting pressures at temperatures as high as 1800 F. Grade 370.

CARBIDE TOOL MATERIAL — *Adamas Carbide Corp, 1000 So Fourth St, Harrison, NJ.* For rough turning of all types of steel and armor plate. Has been used on cast 309B stainless with feeds ranging from 0.015 to 0.068 ipr and speeds from 68 to 600 sfpm. Grade 434.

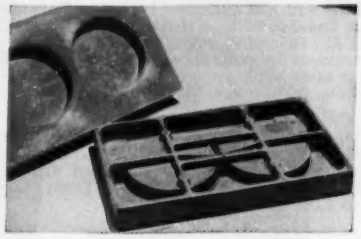
SINTERED CARBIDE—*Harwil Ventures, 2746 W 59th St, Chicago 29, Ill.* Process said to increase cutting life from two- to ten-fold. May be used on any grade of carbide on market. Does not merely impart case-hardening, but penetrates entire volume. Process BK4.

ANODE BAG FABRIC — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* Nylon material said to increase life of bags and diaphragms used to screen anode sludge from plating solution.

TITANIUM STRIPS—*American Silver Co, Industrial Div, 36-07 Prince St, Flushing 54, NY.* Strips up to 8 in. wide with thickness down to 0.0005 in. and tolerance of ±0.0001 in.

METAL STRIP—*American Silver Co, 36-07 Prince St, Flushing 54, NY.* Line includes beryllium copper alloys, stainless steels, carbon steels, nickel base alloys, titanium, tantalum, zirconium, and Invar. Line of thermostatic bimetals is also available.

HIGH-TEMP ALLOYS—*Firth Sterling, 3113 Forbes St, Pittsburgh 30, Pa.* Chromium carbides; said to have high resistance to oxidation, lower weight, and higher coefficient of expansion than other carbides. Also heavy metal, with spg of 17.5 to 18.2, which can reportedly be easily machined with HSS tools.



PLASTIC CORE DRYER — *Formed Plastics Co, Toledo, Ohio.* Replacing aluminum; said to cut material costs 2/3 and core-baking time 11/12. Designed to take advantage of dielectric heating to bake cores. Cores are made at rate of 12 per hr on Stokes 200-ton compression press and are being used for casting both ferrous and non-ferrous metals.

BERYLLIUM COPPER — *Industrial Div, American Silver Co, 36-07 Prince St, Flushing 54, NY.* Alloys No. 10, 25, and 165 are available in strips to 8 in. wide with thickness down to 0.0005 in. with tolerance of ±0.0001 in. Solution-annealed or rolled to temper.

MAGNESIUM ALLOY INGOT — *Dow Chemical Co, Midland, Mich.* Contains beryllium additions for lower melt loss and increased efficiency in magnesium die casting. Price: $0.305 per lb.

COPPER CYANIDE—*Kraft Chemical Co, Kaynide Div, 917 W 18th St, Chicago 8, Ill.* Reportedly whiter in color and of exceptionally uniform quality.

STRIP METALS — *American Silver Co, 36-07 Prince St, Flushing 54, NY.* Gold clad to cepper, brass, or bronze. Widths to 8 in.; thicknesses down to 0.0005 in. with tolerances of ±0.0001 in.

HIGH-LUSTER METAL — *Fromson Orban Co, Inc, 205 E 42nd St, New York, NY.* For fabricating lightweight metal parts with permanently lustrous high finish. It is alloyed with varying percentages of magnesium for different applications. Lurium. German.

TANTALUM STRIPS—*American Silver Co, Inc, 36-07 Prince St, Flushing, NY.* Strips are available up to 6 in. wide and down to 0.0005 in. thick with tolerance to ±0.0001 in.

DENSE METAL — *Metal Carbides Corp, 107 E Indianola Ave, Youngstown, Ohio.* Suitable for static and dynamic balancing; comprised chiefly of tungsten; readily machined with carbide-tipped tools.

SELF-LUBRICATING METAL—*Booker-Cooper Inc, 8487 Melrose Pl, Los Angeles 46, Calif.* Employs both ferrous and non-ferrous metals; said to have exceptional bearing strength. Ratio of lubricative pigments to metal can be controlled to meet specific pressure requirements.

PLASTIC MATERIALS — *Synthane Corp, Oaks, Pa.* Variety of grades of thermosetting laminated plastics in flat sheets from 0.005 to 8-in. thick, tubes from 1/16 to 26 in., and rods to 4 in.

PARTS and MATERIALS—materials, processes

PLASTIC TUBING—*Irvington Varnish & Insulator Co, Fibron Div, Irvington, NJ.* Provides high flexibility at extremely low temperatures; can be used as both primary and secondary insulation. Meets specification MIL 1-7444A.

PLASTIC WINDOWS — *Cast Optics Corp, Riverside, Conn.* Acid- and alkali-resistant sheets in sizes up to 6x60 or 38x96 in.; thicknesses from 0.020 to 1.000 in. Cocor CR-39.

PHENOL LAMINATES—*Taylor Fibre Co, Norristown, Pa.* Two series of phenol laminated plastics. Series XXXP-300 provides high insulation resistance and meets rigorous staking and punching requirements. It is a hot-punch material (135 C). XP-400 is a cold-punching laminate affording new opportunities for uniformity in fabrication.

PLASTIC COAT — *Pyramid Plastics, 554 W Polk St, Chicago, Ill.* For application to flexible steel tubing and metal- and paper-jacketed tubing.

PLASTIC COATING—*Fidelity Chemical Products Corp, 470-474 Frelinghuysen Ave, Newark, NJ.* Strippable coating for temporary protection against corrosion. Peeled material may be used again after remelting. Formula No. 595.

PLASTIC COATING — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* For insulating racks, fixtures and anode hooks for electroplating baths.

SILICONE RUBBER — *Dow Corning Corp, Midland, Mich.* For fabricating gaskets, diaphragms, switch boots, and dielectrics. Can be molded in dies designed for organic rubber parts. Serviceable at temperatures from —100 to +500 F.

RUBBER COATING — *Munray Products, Inc, 12400 Crossburn Ave, Cleveland 11, Ohio.* Plastisol coating for metal parts; resistant to oils, acids, and oxidation. Thickness from 1/32 to ½ in.

GLASS CLOTH — *Acadia Synthetic Products Div, Western Felt Works, 4115 Ogden Ave, Chicago, Ill.* Silicone-coated to withstand temperature range of —70 to +400 F. Material is heat- and oil-resistant. Compound HR-166-171.

LUBRICANT FILM—*The Alpha Corp, 179 Hamilton Ave, Greenwich, Conn.* For use where heavier and longer-lasting dry lubricating film is desired. Applied by spraying, brushing, or dipping. Coating ranges from 0.0002 to 0.0007 in. in thickness. Molykote M-88.

ADHESIVE — *Flexrock Co, Packing Div, 3600-A Filbert St, Philadelphia 1, Pa.* Binds Teflon to Teflon or metal. Direct pull strength is 12 to 15 psi. Applied by brushing, dipping, or spraying. No. 80.

RESIN CEMENT — *Delrac Corp, Watertown, NY.* Mortar for acid brick or tile in corrosion-resistant tank linings withstands temperatures to 375°. Resiment.

CEMENT — *Adhesive Products Corp, 1660 Boone Ave, New York 60, NY.* Adheres sandpaper to metal or wood sanding disks. Said to be highly heat resistant. Griptex No. 994.

ALUMINUM BONDING METAL — *Paul E Reimuller, Glendora, Calif.* Surface need not be specially prepared; requires no flux. Melt temperatures from 425 to 824 F with tensile strength from 20,000 to 45,000 psi.

RUBBER-METAL BOND — *Advance Rubber Co, 1702 Washington Ave, Minneapolis, Minn.* Bonds natural, synthetic, or silicone rubber to metal; allows parts with metal cores to be ground concentric within ±0.002 in.

INSULATED RESIN — *Dow Corning Corp, Midland, Mich.* For coating glass cloth and sleeving, and for bonding mica-glass combinations. Silicone varnish 994.

ADHESIVE—*Miracle Adhesives Corp, 214 E 53rd St, New York 22, NY.* Joins similar or dissimilar metals or materials with bond strength of 3000 lb per sq in. Said to set in 10 min. Adweld.

HARD-FACING ALLOY — *Coast Metals, Inc, Little Ferry, NJ.* Resists abrasion at high temperatures. Wells over itself and more ferrous material without cracking or checking. Alloy CM-199.

IMPREGNATING VARNISH — *Dow Corning Corp, Midland, Mich.* For class H insulation; claimed to cure as rapidly as class B varnishes and to have over 100 times their dielectric life at 200 C. Type 997.

ENAMEL-ALUMINUM BOND — *Halrick, Inc, 31 Crosby St, Danbury, Conn.* Produces surface coating highly resistant to strong detergents, acids, alkalis, and sulphides as well as thermal shock and impact. Enameled aluminum can be sheared or drilled with minimum spalling.

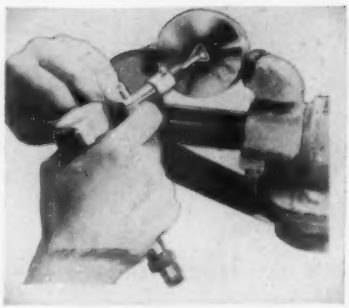
TALL OIL—*Farac Oil & Chemical Co, 145 St & Indiana Ave, Chicago, Ill.* Replacement for rosin-fatty acid mixtures used in varnish production. Requires no melting or blending; mixes with all petroleum bases. Flextal.

ACID POWDER — *Enthone, Inc, 442 Elm St, New Haven, Conn.* Replaces hydrofluoric acid. Contains soluble fluorides and penetrating and dispersing agents. Actane 33.

HARD SURFACING — *Lincoln Electric Co, Cleveland 17, Ohio.* Alloy content of deposited metal is supplied by agglomerated flux rather than electrode. Automatic hard surfacing can be done with ordinary mild steel electrode. Any standard welding head may be used. Two fluxes are available: H-545 for good abrasion resistance and H-550 for extreme abrasion resistance.

RUBBER METAL BONDING — *Stillman Rubber Co, 5811 Marilyn Ave, Culver City, Calif.* Bonds aluminum to various compounds of rubber, synthetic or silicone. Finish can reportedly be as fine as 5 mu-in. Permadizing.

POWDER-CUTTING—*National Cylinder Gas Co, 840 N Michigan Ave, Chicago 11, Ill.* Powder-dispensing unit features improved regulating and ejecting mechanism said to provide uniformity of flow. Gas pressure and rate of powder flow are automatically maintained. Ferrojet.



DIE-MAKING PROCESS—*Nord International Corp, Denville, NJ.* Tungsten carbide dies can be repaired or produced from blanks of presintered carbide by using the Di-Profiler. Stroke is adjustable from 0 to 0.25 in. Variety of diamond files are available in addition to complete line of burs.

HARD SURFACING—*Pyrene Manufacturing Co, Metal Finishing Div, 560 Belmont Ave, Newark 8, NJ.* Process is said to make surface of aluminum more resistant to wear than chrome plating.

ACID-RECOVERY PROCESS—*Barnstead Still & Sterilizer Co, 132 Lanesville Terrace, Forest Hills, Boston, Mass.* Chromic acid is recovered from rinse water passed through ion-exchange resins. Resins can be used for 100 cycles.

SURFACING PROCESS — *American Metaseal Mfg Co, West New York, NJ.* Controlled high-pressure spray produces minute pits that can be varied in coarseness by using different grades of Metablast abrasive, and changing length, force, or direction of spray. It is claimed that process allows predetermined surfaces to be obtained time after time without variation.

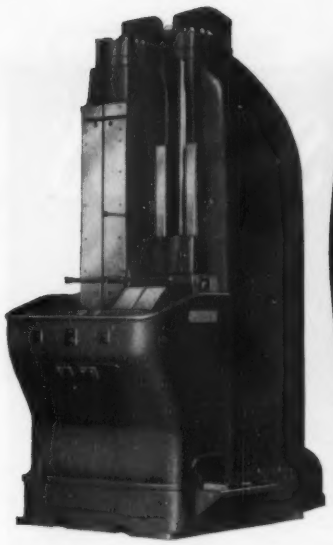
COLD TREATMENT—*Bowser Technical Refrigeration, Terryville, Conn.* Units have lower limits ranging from —50 to —200 F.

DIAMOND POWDER PROCESS — *Gubelin International Corp, 35 W 53rd St, New York, NY.* For separation of fused alumina from diamond powders. First operation removes 98% of original content.

POWDERED METAL KIT — *Matachem Laboratories, Inc, 6301 Indianapolis Blvd, Hammond, Ind.* Packaged kit for production of powdered metal parts includes 10,000-lb capacity hydraulic press, standard bushing, die, balance, weights, and 10-lb bags of mix to produce brass, bronze, iron alloy and pure iron parts.

FERROUS METAL TREATMENT — *Thompson & Co, 1085 Allegheny Ave, Oakmont, Pa.* Formulated for roller coating on ferrous metals. When baked, it provides adhesion qualities and resistance to all exposure. Vinsynite FS-3.

CASE HARDENING—*Pivot Punch & Die Corp, North Tonawanda, NY.* Produces extremely hard surface on piercing diameter of X and Y Series Pivot punches.



Duplex Surface Broaching Machine. Made in 5, 10, 15 and 25 Ton Sizes.

for increased production

latest surface broaching methods on cast iron parts, teeth serrations and slots..

Single Slide Surface Broaching Machine. Made in 5, 10, 15 and 25 Ton Sizes.

Continuous Type Broaching Machine. Made in 4 Sizes.

● Whether the material is steel or cast iron, parts are being successfully surface broached on Footburt machines. Broaches used on Footburt Surface Broaching Machines have a patented tooth that is especially advantageous on heavy cuts. We will be glad to work with you on your machining problems and make recommendations based on our many years experience in surface broaching.

THE FOOTE-BURT COMPANY, Cleveland 8, Ohio

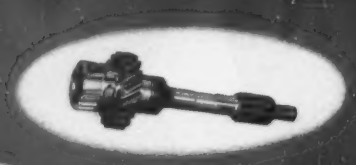
Detroit Office: General Motors Building

FOOTBURT

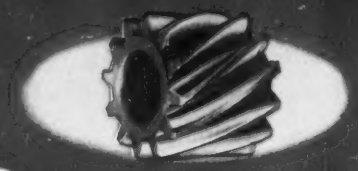
SURFACE BROACHING

GEARS SHAVED in 12 to 20 SECONDS

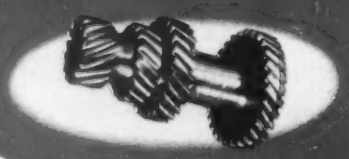
Finishing precision gears to close tolerances on tooth profile, index, eccentricity and tooth surface smoothness on Red Ring Shaving Machines is a high production operation as indicated by these random examples.



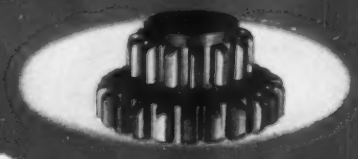
A SHAVING TIME 16 SECONDS



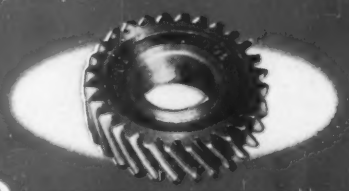
D SHAVING TIME 12 SECONDS



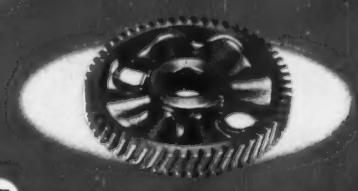
B SHAVING TIME 16 SECONDS



E SHAVING TIME 15 SECONDS



C SHAVING TIME 20 SECONDS



F SHAVING TIME 20 SECONDS

GEAR CHARACTERISTICS

Gear	Stock Removed Over Pins	Material	No. of Teeth	PD	DP	Face Width
A	.010″	Steel	19	2.4″	9.25	5/8″
B	.010″	Steel	29	4.00	9.25	1 1/16″
C	.010″	Cast Iron	28	2 5/16″	10	1 1/16″
D	.005″	Steel	12	1 1/8″	13.5	1″
E	.006″	Steel	14	2 1/16″	6/8	1 1/16″
F	.012″	Aluminum	54	5 7/16″	10	7/8″

WRITE FOR DESCRIPTIVE LITERATURE ON *Red Ring Gear Shaving*

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

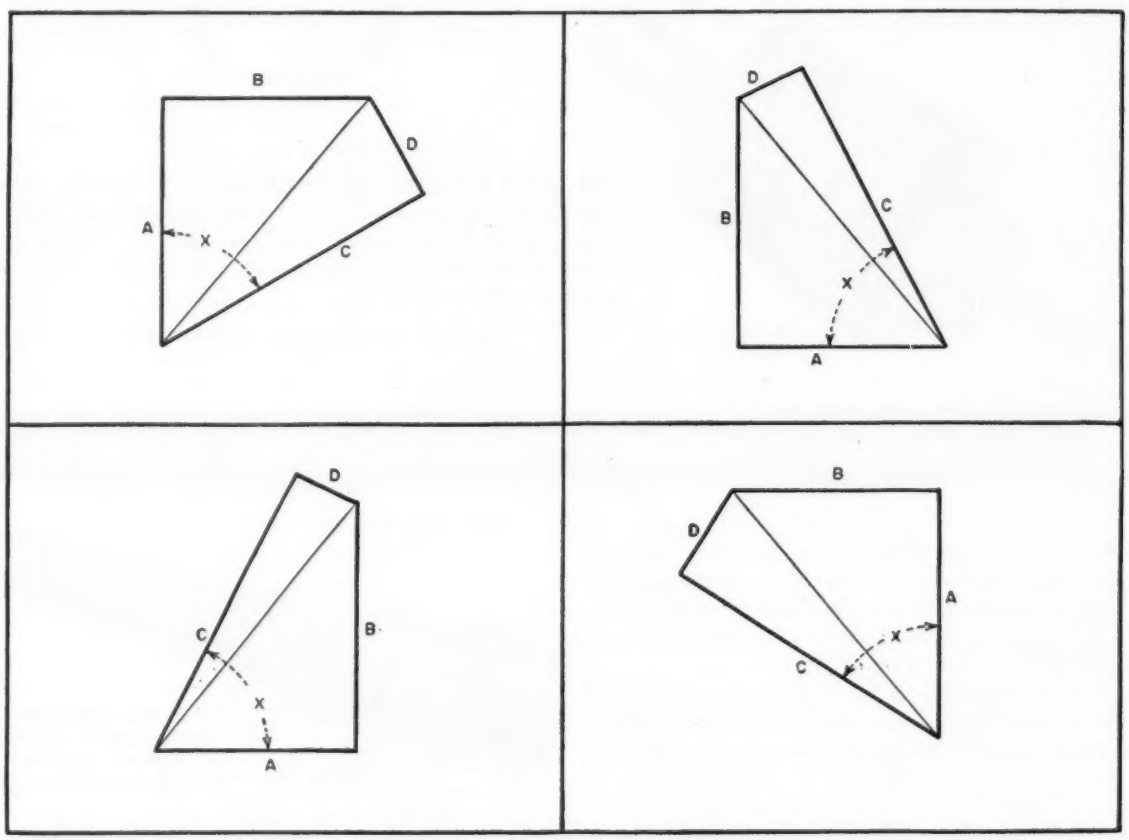
Formulas for Adjacent Triangles

By J R PAQUIN

The formulas given will be found useful in the solution of numerous engineering problems, where adjacent right angle triangles must be solved and the large angle X is known.

This condition is particularly encounted in laying out multiple-station progressive dies with the part blanked at an angle to conserve material. The jig-boring layouts for such dies often involve dozens of trigonometric problems. Use of the chart and formulas can often cut down the number of problems that must be solved, decreasing the time spent in calculations and reducing the possibility of error.

The trigonometric figure is shown in four positions to aid in visualizing application.



$$D = A \sin X - B \cos X$$
$$C = A \cos X + B \sin X$$

$$B = C \sin X - D \cos X$$
$$A = D \sin X + C \cos X$$

$$\text{Sin } X = \frac{BC + AD}{B^2 + A^2}$$

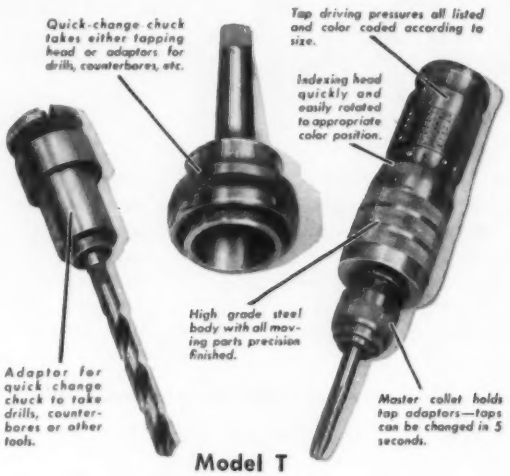
WICKMAN TAPPING ATTACHMENTS
Instant Pre-Selection of Tapping Torques

Pre-selected tapping torques are instantly obtained by presetting the pressure on a two tooth clutch to the required tap size. This is done by means of a highly resilient pressure unit which allows the clutch to slip when tap is overloaded.

WICKMAN HIGH SPEED TAPPING ATTACHMENTS (Model K) are furnished with Morse Taper Shank attached as an integral unit. Special shanks are furnished on request.

WICKMAN COMBINATION TAPPING ATTACHMENTS (Model T) are designed to fit readily into or be removed from their quick-change chuck even while machine spindle is running. Wickman adaptors for holding drills, counterbores or any other tooling required for your operation can be inserted in the same chuck.

Models K & T sizes and range: from 3/16" to 1 3/4".


Quick-change chuck takes either tapping head or adaptors for drills, counterbores, etc.
Tap driving pressures all listed and color coded according to size.
Indexing head quickly and easily rotated to appropriate color position.
High grade steel body with all moving parts precision finished.
Adaptor for quick change chuck to take drills, counterbores or other tools.
Master collet holds tap adaptors—taps can be changed in 5 seconds.

Model T

Model TS

WICKMAN TAPPING ATTACHMENTS FOR TURRET LATHES (Model TS) are considerably shorter than Models K & T. They also permit presetting of tapping torque required for any tap size or material, thus preventing tap breakage in blind hole tapping or materials difficult to tap.

Model TS sizes and range: from 3/16" to 1".

WICKMAN-BROWN ADJUSTABLE FLOATING REAMERS

Equipped with fully floating blades and direct reading micrometer adjustment, Wickman-Brown Reamers do not require special tools for setting. Reamers may be operated rotating or stationary and are furnished with either high speed or carbide tipped blades.

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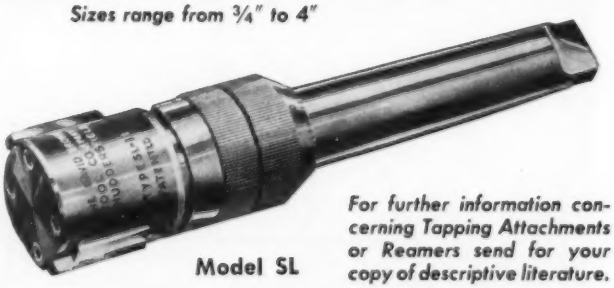

Model SL

For further information concerning Tapping Attachments or Reamers send for your copy of descriptive literature.

THE Wickman MANUFACTURING CO.
10325 CAPITAL AVENUE
OAK PARK (Detroit 37), MICH.

Contact Ratios for Undercut Gear Teeth... I

By OLIVER SAARI, Development Engineer, ILLINOIS TOOL WORKS

Undercutting is the removal of part of an involute gear tooth profle by the tip of the generating tool. In hobbed gears, undercut exists whenever the hob addendum is greater than $R_p \sin^2 \phi$. (This and what follows apply only to sharp-cornered hob teeth. If the corners have radii, a good approximation results if the addendum used in the formulas is the actual hob addendum minus one half the tip radius.) Undercut is not detrimental to the action of the gear teeth, provided the beam strength of the teeth is not too greatly diminished and not too much of the involute profile is removed. Sufficient profile must exist on the hobbed gear to allow a contact ratio greater than one, or else the gear will not mesh properly with any other gear.

The tip of the generating hob tooth sweeps out a curve similar to the one shown in Fig. 1. The intersection of this curve with the involute tooth profile is the start of undercut. Sufficient involute must exist above this point to permit "carryover" of contact.

The location of the start of undercut can be found analytically by the simultaneous solution of the equations of the undercut curve

FORMULAS:

$$R_p = \frac{N}{2P}$$

$$R_o = R_p + \frac{1}{P}$$

$$R_B = R_p \cos \phi$$

$$p = \frac{\pi}{P}$$

$$p_b = p \cos \phi$$

$$S_p = R_p \sin \phi$$

$$S_o = \sqrt{R_o^2 - R_B^2}$$

$$S_u = S_p - (S_p - S_u)$$

$$R_u = \sqrt{R_B^2 + S_u^2}$$

$$m_p = \frac{(S_o - S_p) + (S_p - S_u)}{p_b}$$

NOMENCLATURE:

- N = number of teeth
- P = diametral pitch
- p = circular pitch
- p_b = base circular pitch
- R_p = pitch radius
- ϕ = hobbing pressure angle
- R_B = base radius
- R_o = outside radius
- a = hob addendum
- R_u = radius to start of undercut
- S_o = scale distance to outside of gear
- S_p = scale distance to pitch radius
- S_u = scale distance to start of undercut
- m_p = maximum possible contact ratio

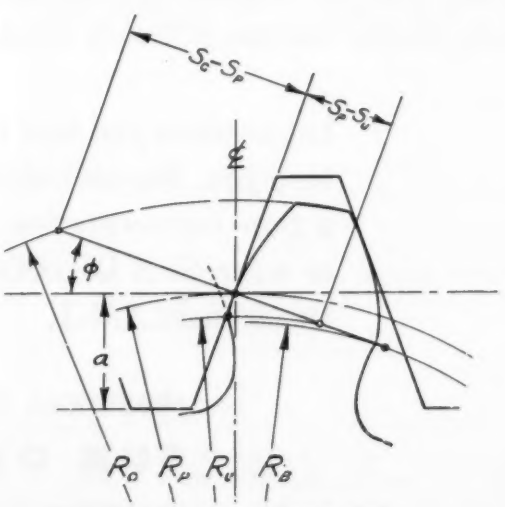

FIG. 1 . . . Undercut involute profile

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In just six months, these unique new straight cutting oils have "Job Proved" themselves as top performers in many metalworking shops all through the industry.

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AN AUTO PARTS MANUFACTURER INFORMS US, "Threaded parts are as much as 50° cooler when they come off the machines. And our operators like the clear, clean, odorless qualities of Sunicut 102-S."

SCREW MACHINE SHOPS REPORT, "The versatility of Sunicut 209-S permits us to reduce the number of oils we must stock."

BROWN & SHARPE SCREW MACHINE OPERATORS SAY, "Sunicut 11-S increases tool life, gives finer finishes, eliminates staining problem."

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Contact Ratios for Undercut Gear Teeth...II

Table I—Maximum Contact Ratios of Undercut Teeth

Number of teeth	m_p (Old Std. $\phi = 14\frac{1}{2}°$ $a = 1.157/P$)	m_p (New Std. $\phi = 20°$ $a = 1.25/P$)
14	1.06	1.35
13	1.00	1.27
12	.94	1.19
11	—	1.10
10	—	1.01
9	—	0.92

and the involute. The chart in Fig. 2 contains the essence of this solution for hob teeth of various pressure angles.

The location of the start of undercut can be designated either by R_u, the radial distance, or by S_u, the scale distance. This is the distance along the line of action, measured from the point of tangency of the line of action and the base circle. Scale distance is a basic measurement used on most involute profile checking machines and can be used directly as shown in the formulas to obtain the contact ratios. Therefore the chart has been graduated for $S_p - S_u$, or the scale distance from the start of undercut to the pitch point. The chart is used as follows:

(1) Divide the hob addendum by pitch radius to get $\frac{a}{R_p}$.

(2) Read from the proper pressure angle curve (the plane-of-rotation pressure angle for helical gears, where interpolation between the curves may be necessary) to obtain $\frac{S_p - S_u}{R_p}$.

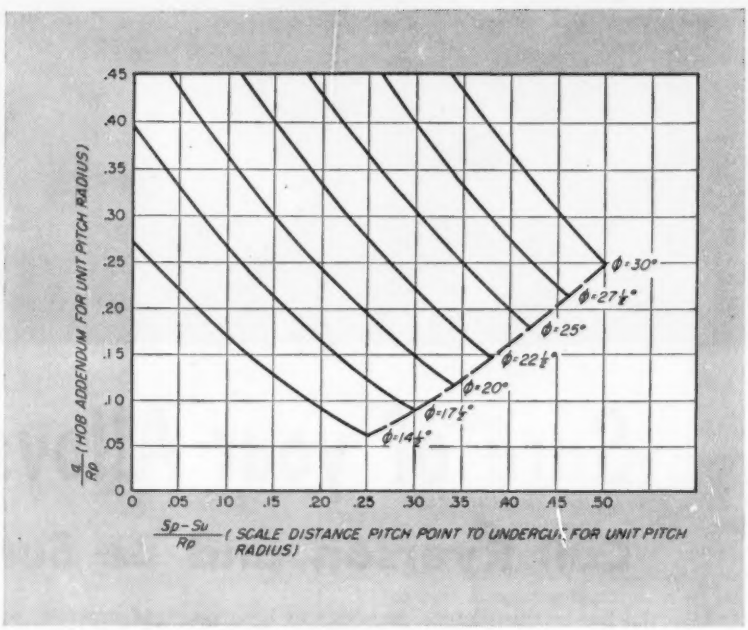

FIG. 2 . . . Chart of determining scale distance to start of undercut

(3) Multiply by pitch radius to get $S_p - S_u$.

This result can be substituted in the formulas to obtain m_p, the maximum possible contract ratio.

As an example of the use of the chart and formulas, some values have been worked out for the old 14½°, pressure-angle standard tooth form, and the proposed new 20° pressure-angle standard tooth form. The results, given in Table I, show that the old standard is useless under 13 teeth whereas the new standard can be used down to 10 teeth without resorting to long-and-short addendum systems. The gear shown in Fig. 1 is the new standard with 10 teeth. Undercutting with the old standard starts at 36 teeth, and with the new at 21 teeth.

The mating gear must, of course, have enough scale distance below its pitch line to utilize the S_o–S_p or "addendum scale" of the pinion, to utilize the maximum contact ratio. This will usually be the case if the mating gear is large enough to have no undercut of its own.

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Like the bar in this picture, *every bar* of Ryerson alloy steel has its mark—a symbol that identifies the particular heat from which the bar was rolled. And on all but the smallest bars this heat symbol is unmistakably stamped into the steel itself.

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TALKING SHOP

Too Good to Last

UNIVERSITY OF MICHIGAN, in its recent Prudential Study, had findings which suggest we may be trying too hard to make workers *happy*, and not hard enough to make them *successful*. There is some question whether people are made happy by being surfeited with benefits. Too many benefits destroy self-respect and even the sense of security. When things are going *too* well, people sometimes have an intuitive feeling that it can't last.

Razor Test

TO DETERMINE neutrality of a neutral salt-bath furnace, Ajax Electric Co, Inc, of Philadelphia, suggests a used razor blade. The blade is put in the bath for 10 min. at temperature, then given a quick water quench. If the blade bends, carbon content of the bath is depleted, so the bath is decarburizing and should be rectified at once. If the blade snaps, the bath is neutral. Because the blade is so thin, it is extremely sensitive to any evidence of oxidizing. Neutral baths are important, because decarburization of steel during heating can cut strength as much as 40%. As received from the mill, billets and bars are usually decarburized, and the bath is depended upon to prevent further carbon loss in heat treatment as well as to remove decarb that exists.

Miller

A MILLING ATTACHMENT for finishing aluminum impeller blades won Leonard Barens, machinist, $7777 for AiResearch Mfg Co, Phoenix. The attachment increases output 500% and gives excellent uniformity of product, vital in a unit that rotates at 70,000 rpm. The company paid out $23,477 in the first 11 months of 1953 on 1493 awards.

Miracles by Appointment

Nov 10, 1953, the New York *Herald-Tribune* carried this ad:

American firm of internationally know engineers is conducting a comprehensive search for a fully qualified Chief Mechanical Engineer. Candidates must have experience in line with the following specifications;

1. Thoroughly experienced in power plant engineering and design.
2. Familiar with engineering requirements for the writing of specifications and reports.
3. Thoroughly conversant with all types of power plant equipment —together with the relative merits and application of the various types.
4. Capable of administering a continuous and imaginative program designed to advance the art of power plant design.
5. Have capacity for intelligence and purposeful team work with all levels of supervision—particularly in follow-up cases.
6. Ability to deal effectively and harmoniously with clients.
7. Sympathetic to the application of techniques of project cost and schedule control to his work.

We appreciate that most candidates probably will not possess all the qua.ifications specified but we feel confident that the candidates meriting serious consideration will possess them in some acceptable combination and will also possess the necessary intelligence and drive to rapidly compensate for those areas in which he is deficient.

The starting salary for this position is not fixed, but is high; the final figure to be arranged between the successful candidate and our management.

If qualified and interested, please submit DETAILED personal history, together with telephone number where you may be reached.

The following telegram was received in answer:

CAN QUALIFY IN ALL RESPECTS PLUS ABILITY TO CREATE LOAVES AND FISHES STOP MIRACLES BY APPOINTMENT STOP YOU CAN REACH ME IN HEAVEN (SIGNED) J C

Spinner

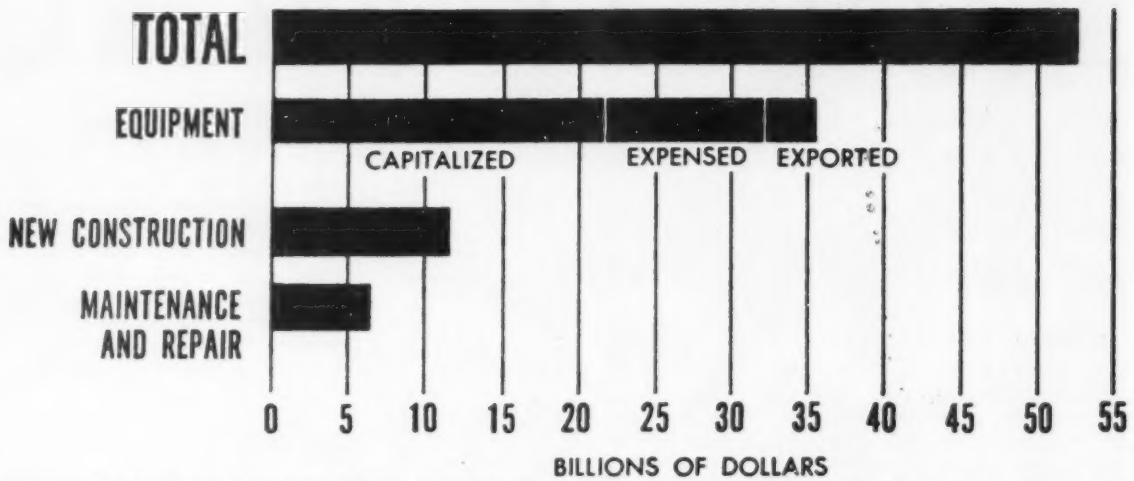
J SCHRADER COMPANY, Cleveland, is using standard ½-in. Stellite toolbits, brazed into steel tubing, to make knifing tools, which trim excess metal from spun parts at 1500 rpm. Parts may be copper, brass, aluminum or carbon steel. Impact breaks down other tool materials quickly, but Star J-metal lasts for 3 months or about 9000 parts. Similar tools do the spinning itself, as well as resurfacing of steel forms.

4 Out of 5

SPEAKER at a recent SAM meeting pointed out that 4 out of 5 working people are employes, compared with 1 out of 5 a hundred years ago. Decreasing owner-managers are replaced by a new profession—management. The manager is a hired hand, but also the boss. He risks other people's money, and must balance the claims of employes who want higher wages, customers who want lower prices, and stockholders who want higher dividends.

Paintesive

DELCO APPLIANCE DIV, GM, in producing house heating units, insulates panels inside with a blanket of fiber faced with aluminum. Specs called for this to be applied with an adhesive after prime coating. One painter suggested application of the blanket directly to the wet paint. It works fine. The blanket is applied right in the paint booth, rolled on with a roller, and really holds. If you've ever tried to open a painted window, you know what we mean.



INDUSTRY OUTLAY ON PLANT & EQUIPMENT FOR 1952 amounted to more than $54 billion, is expected to top $58 billion for 1953. This includes production, transportation, distribution and servicing of plant and equipment

US 1953 Capital Goods Output Tops

CHICAGO — America's capital goods output for 1953 reached the $58 billion mark, with more than 8.2 million people employed in its various phases — production, transportation, distribution and servicing of capital plant and equipment. These figures are based on a study just published by the Machinery and Allied Products Institute's Council for Technological Advancement. Thus 1953 tops the 1952 total of $54 billion capital goods output, with 8.1 million workers engaged in its various phases.

The Council's findings on the size and structure of US capital goods industries in 1952, published in its Bulletin 16, can be broken down into these study highlights:

• **Productive activity:** $54 billion was spent in 1952 for producing, transporting, distributing and servicing capital plant and equipment — $35 billion for equipment, $12 billion for construction, and $7 billion for servicing (maintenance and repair).

• **Employment:** Some 8.1 million persons were employed in 1952 in the capital goods industries — 4.8 million in equipment, 1.9 million in construction, and 1.4 million in servicing.

• **Percentage of US industrial output:** The production and servicing of capital goods and allied industrial equipment accounted for 18.5% of total US industrial output, and 19.5% of private US non-agricultural employment in 1952.

• **Largest employer group:** Capital goods industries employed more people in 1952 than any similar group of manufacturing industries.

• **Secondary employment:** For every 1000 workers employed in producing finished productive equipment, about 914 were employed in supply and supporting industries, 277 in distribution and 43 in transporting capital goods.

• **Product variety:** 1952 capital goods produced ranged from huge, complicated custom-engineered equipment down to small mass-produced parts and components.

• **Exports:** Almost $3 billion in capital goods were exported in 1952, giving employment to some 400,000 workers — about 66,000 of them engaged in transporting and distributing capital goods.

For each million dollars of durable productive equipment manufactured in 1952, about 140 man years of employment were required — 62 in direct production, 57 in production and transportation of raw materials, and 20 in transportation and distribution of the finished product to the consumer. Thus for every 1000 employed by industries producing finished durable productive equipment, about 914 were engaged in supplying and supporting industries, 277 in distributing products to final users, and 43 in transportation of finished goods—a total of 1234. And it is estimated by CTA that maintenance and repair construction of capital plant requires 1000 persons for every 1000 persons directly employed in actual maintenance construction work.

Advocates Better Equipment Policy

If a more dynamic equipment policy, as advocated by MAPI, should be adopted, the CTA report says that it could raise the output of capital goods as much as $2 billion above the present $35 billion: this would result in employment of an additional 265,000 people — 120,000 for production in the capital goods industries themselves, 110,000 for supplier industries, and 35,000 for transportation and distribution.

No one industry dominates production of capital goods and equipment. Largest industry in terms of employment is electrical machinery and apparatus, employing 365,000 in 1952. Yet this accounted for only 14% of the 2.6 million employed in the productive equipment industries as a whole. In number of employees, the motor vehicle industry ranked second, with 357,000. Miscellaneous machinery parts producers employed 238,000, and metalworking (including machine tools) employed 280,000.

To quote the CTA report:

"Preliminary estimates of produc-

PRIVATE PURCHASES OF CAPITALIZED PRODUCTIVE EQUIPMENT 1952
(Millions of Dollars)

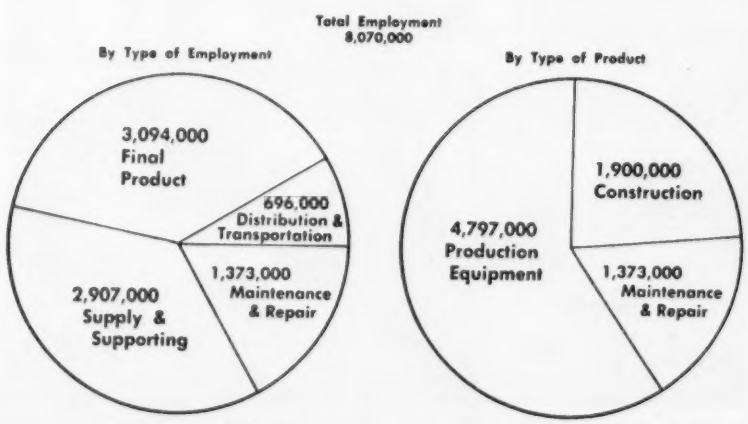
	Purchases	% of total
Metalworking machinery (incl. machine tools)	$1197	5.4
Special industry machinery	1574	7.1
General industry machinery	1585	7.2
Office and store machinery	750	3.4
Service industry machines	926	4.2
Electrical machinery	2865	13.0
Furniture and fixtures (non-residential)	855	3.9
Fabricated metal products	360	1.6
Engines and turbines	268	1.2
Tractors	976	4.4
Agricultural machinery (except tractors)	1161	5.3
Construction machinery	640	2.9
Mining and oil-field machinery	792	3.6
Trucks, buses, trailers	2466	11.2
Passenger cars (for business use)	3309	15.0
Aircraft	167	.8
Ship and boat building	192	.9
Railroad equipment	935	4.2
Instruments	588	2.7
Miscellaneous equipment	440	2.0
TOTAL PRODUCERS' DURABLE EQUIPMENT	$22,046	100.0

1952's $54 Billion

tion and employment in the capital goods and allied equipment industries . . . in 1953 indicate a significant increase over 1952. By the third quarter of 1953, the annual rate of expenditures on capital goods, including servicing and maintenance, had increased by $4 billion over the 1952 levels, bringing total expenditures to $57.8 billion. This 7½% increase was about evenly divided between price increases and increases in real physical output.

"The largest areas of increase have been in public utility and commercial construction, although all other areas except construction of farm service buildings and industrial construction showed some rise.

"After adjustment for price changes and probable increases in output per man hour, it may be estimated that employment attributable to the production and maintenance of capital goods and allied industrial equipment rose about 2% between the 1952 average and the third quarter of 1953. Thus at present, capital goods employment approximates 8.2 million workers, compared with the 8.1 million average employed in 1952."



WORKERS EMPLOYED IN PRODUCTION OF CAPITAL GOODS 1952

ALUMINUM OUTPUT AT ALL-TIME HIGH

PITTSBURGH — America's aluminum industry topped its all-time production record in 1953 with about 1.25 million tons primary metal output — 313,000 tons more than was produced in 1952 and an increase of 33% over that year. Thus the industry for the second time (first was in 1952) tops its World War II peak of 920,000 tons output.

Record production was accomplished in spite of low rainfall, particularly in the South, that reduced the hydroelectric power necessary to aluminum production.

Increased acceptance by industry of aluminum for a variety of new uses is listed as one of the chief reasons for the phenomenal growth in aluminum output. Among the newer uses of aluminum as listed by Aluminum Co of America are:

Foil and sheet for offset printing litho plates, sheet for letter-press engraving; building hardware; highway signs and markers, automotive hardware and trim, irrigation pipe for farms, facing for buildings, covered aluminum wire for secondary distribution lines, and more use of aluminum in appliances. And two new aluminum alloys have been developed, one for casting and one for forging, to be used in jet engines. They will withstand temperatures of 450 F to 750 F.

FURNACE MAKERS LIST TECHNICAL IMPROVEMENTS

WASHINGTON—Modernization and replacement will keynote the 1954 work of the Industrial Furnace Manufacturers Association, meeting this month in Philadelphia. The Association, working with gas and electric utilities, will launch a campaign to acquaint industrial users with the latest developments in industrial furnaces. As cited recently by Carl L Ipsen, executive vice president of the Association, these are:

- **Controlled atmosphere furnaces**— in which protective gases maintain bright surfaces and accurately control surface carburization.
- **Salt bath furnaces** — in which molten salts both heat and control surface conditions of metals during heat treatment.
- **Automation of furnace equipment** — by which processes are made continuous and are handled mechanically in precisely controlled time and temperature cycles.
- **Greater safety** — protection of operators from noxious fumes, excessive heat, moving parts, etc.

MACHINE DESIGN CONFERENCE SCHEDULED

CLEVELAND — "New Horizons in Machine Design" will be the subject of an all-day conference to be held here by the Cleveland Engineering Society February 1. Eight top authorities from the machine-tool and metalworking industries will discuss varying phases of machine design and what the machine of tomorrow must accomplish.

Included in the discussion topics will be human engineering, new approaches to machine design, new applications and designs from patents, effects of technological advances on sales and the engineering department, European machine design and foreign attitudes toward US machine tools.

Keynote talk, on "New Production Methods and Machine Design," will be given by Walter P Hill, president, Hill Engineering Co, Detroit.

Other scheduled speakers include: A W Richards of Designers for Industry, Inc, on "Fitting the Machine to the Man"; Spencer Bowman, LeRoi Co, on "New Design Methods"; Joseph H Gepfert, "Business Competition and the Engineering Dept"; R G Nightingale, Wheeler Associates, on "Gearing Your Engineering for Today's Needs"; Nobel Clark, Warner & Swasey Co, on "How Good Is European Machine Design?"; N C Rubin, Yoder Co, on "Applying American Machines to European Production"; and George V Woodlow, Flodar Co, on "New Applications and Designs from Patents."

John C Ponstingl of Westinghouse is conference chairman.

Detroit Metalworking Executives See Stiff Competition in '54

DETROIT—Metalworking can look forward to stiff competition in 1954. This is the consensus of local executives from many branches of the metalworking industry, as revealed in an informal survey of business opinion here.

Other trends to look for this year in metalworking are increased stress on product design and re-design, more production through automation, and new developments to meet demands of the atomic age.

Effect of Atomic Age

According to Oscar L Bard, president, Michigan Tool Co, the atomic age will shortly impress itself upon the machine tool industry because "the huge power output of future atomic installations predicates the production of power gear trains capable of transmitting huge loads at high speeds. To the gearing industry . . . this means bigger quantities of precise gearing in large sizes."

Quizzed on the business outlook for the industrial pump industry, J Ralph Griffin, sales manager, Detroit Harvester Co Pioneer Pump Division, said that the pump business "will be partially sustained by demand for certain types of machines and equipment now scheduled for uninterrupted production through the third and fourth quarters of 1954." In this, the industrial pump industry has an outlook similar to that of the machine-tool industry, Mr. Griffith said.

He added that the outstanding trend in pump design will be toward the specific requirements of improved high-speed machines and tools in the metal cutting industry, and increasingly strict conformity to JIC electrical standards.

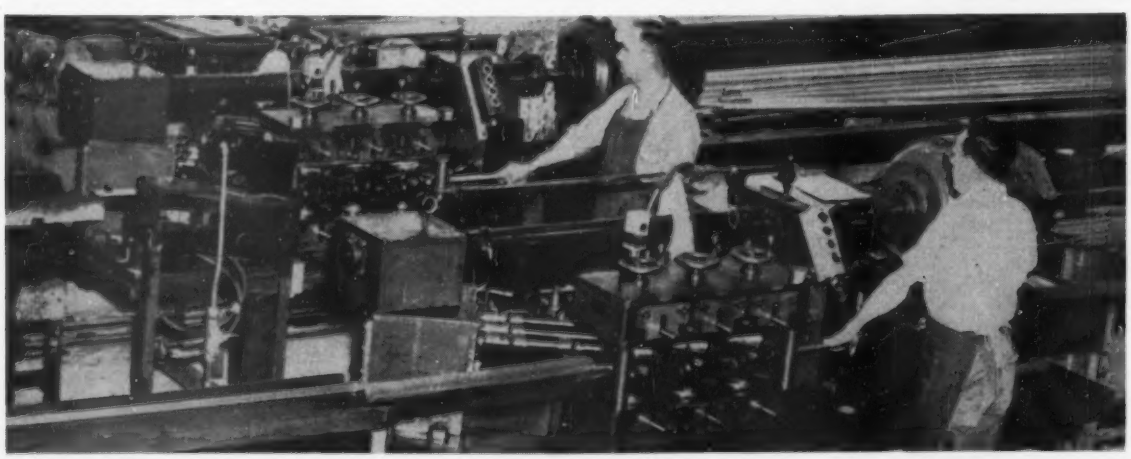
Increased business for marking device manufacturers through automation was forecast by Carl O Malmstrom, manager, New Method Steel Stamps, Inc, who said that many manufacturers are incorporating these devices in their automation equipment, such as screw and bar machines, to eliminate expensive secondary operations. "Parts that never have been marked before because of extra handling costs are now being marked automatically," he said.

General-Purpose Cutting Fluids

The G-M Livonia fire disaster will still have its effects on industry in 1954, according to Larry A Bard, manager, Shear-Speed Chemical Products, who predicted that the "use of water-soluble cutting fluids will increase in 1954."

"The attention drawn to the danger of fire by the G-M Livonia disaster is creating emphasis in this field," he said. "Desire for decreased inventories of on hand stocks of cutting fluids in plants will boost the market for general-purpose fluids."

"Special compounds for each operation," he added, "do not lend themselves to centralized fluid systems which can supply a battery of machine tools in automatic plants."



STRAIGHTENING TITANIUM TUBING at Superior Tube Co's Norristown, Pa., plant, where two Mackintosh-Hemphill units are used to straighten tubing up to 1¼-in. OD. Tube lengths average 12 ft, will shortly be increased to 24 ft

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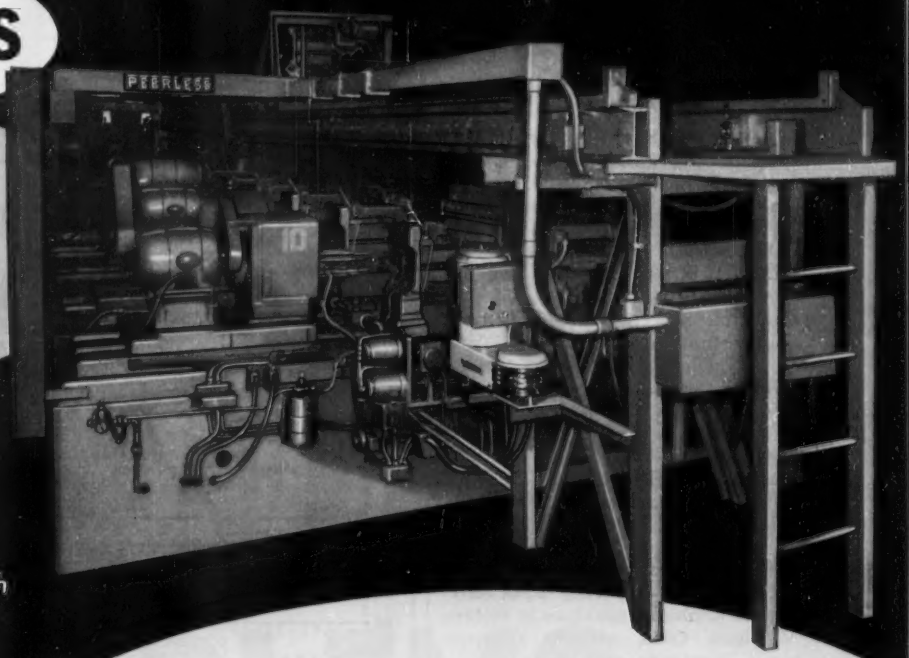
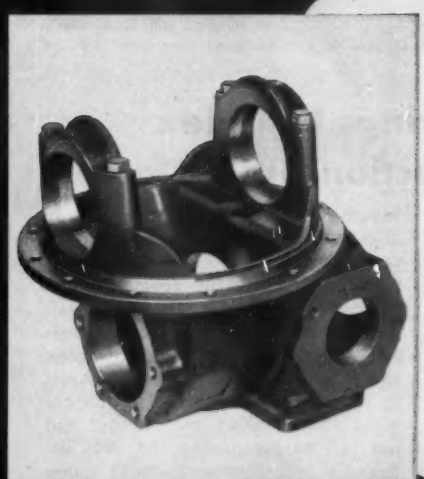


like the precision work by this transfer machine which replaced an entire department



Before this PEERLESS, an entire department was employed to process various differential carriers.

Now, this PEERLESS takes these raw cast carriers . . . roughs and finishes them . . . and then completes rough-and-finished boring and facing operations, as well as drilling and tapping—

And still holding precision boring and facing tolerances!

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Part and Production: Differential Carrier for heavy truck axle. 40 pieces per hour at 100% efficiency.

Type of Equipment: 8-Station Transfer Machine with 5 working, 1 load and unload, and 2 idle stations, utilizing a hydraulically-actuated transfer mechanism for pallet movement. Power-operated overhead pallet-return conveyor and elevators. Peerless 17"-way floor-type Hydraulic Feed Unit. Peerless hydraulically-actuated Bore Face Unit. Colored-light Operator Control Board.

Tooling: Single-place pallet fixtures with automatic positive positioning. Hydraulically-actuated boring and facing heads. Fixed-center ball-bearing drill heads and individual lead-screw tapping heads.

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W F Obear & Son, Los Angeles—for **Quijada Tool Div, Gaines-Collins** automatic pipe cutting and threading machines in 11 Western states.

C W Davidson Co, Indianapolis (for Indiana); **E W Keir Co,** Milwaukee (for Wisconsin); **Gopher Drill & Tool Co,** Minneapolis (for Minnesota); and **Sooner Industrial Supply Co,** Tulsa (for Oklahoma) to distribute **Adamas Carbide Corp's** line of carbide tools, tips and dies.

Tool Crib Inc, Minneapolis, and **Harwood Supply Co,** East Rochester, NY — for **Pipe Machinery Co's** quality control gages.

Motch & Merryweather Machinery Co, Cleveland—for **White-Roth Burrmaster** tumbling machines in eastern Michigan, Ohio, western Pennsylvania, Kentucky and W Va.

International Machinery Co, New Haven, Conn — for **Kurt Orban Co's** line of German machine tools in southern New England.

Firth Sterling, Inc, has moved its Southern District Office to 2201 Highland Ave, Birmingham, Ala.

Mahar Tool Supply Co, Inc, Saginaw, Mich — for **G-E Carboloy Dept's** line of cemented carbide tools and blanks, carbide-tipped masonry drills, diamond wheel dressers.

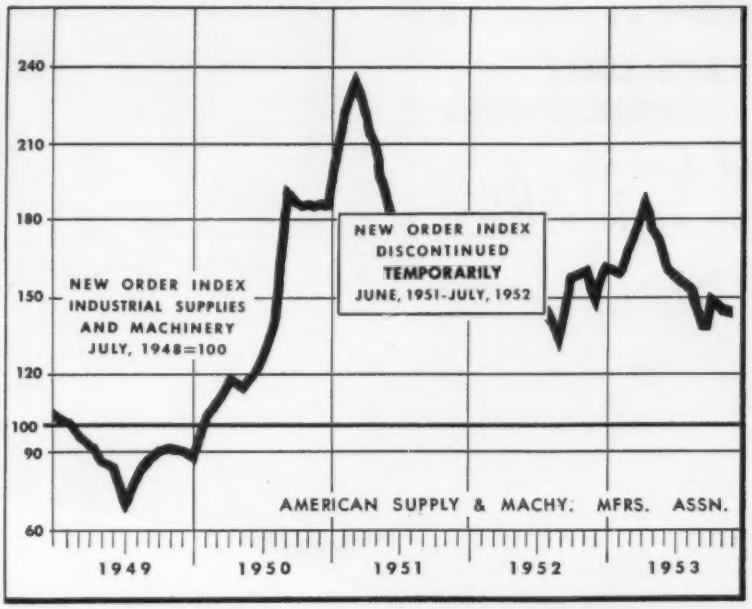
Connell Machinery Co, Toledo, Ohio —for **R K LeBlond Machine Tool Co's** complete line of lathes and lathe attachments in NW Ohio.

M J Schmitt Machine Tools, Milwaukee — for **Hendey Machine Co, Inc's** lathes and shapers in Wisconsin.

Transmission Engineering Co, Philadelphia (for Delaware, SE Penna, southern NJ and eastern Md) — for **Michigan Tool Co's** Cone-Drive Gears.

Clifford Metal Sales Co, Providence, RI — for **American Smelting & Refining Co's** continuous-cast bronze products in Rhode Island.

Industrial Maintenance Corp, Memphis; **Cardinal Steel Co,** Cleveland; and **Vocar Manufacturing & Sales,** Prospect Heights, Ill—for **Basco Manufacturing Co's** line of sheet steel separators.



STEADY DECLINE IN NEW ORDERS FOR INDUSTRIAL SUPPLIES AND MACHINERY since March 1953 is reported by the American Supply & Machinery Manufacturers' Association, whose members are suppliers to the manufacturing industries. But during the late fall months, the decline leveled off somewhat, paralleling recent minor falling off in industrial production, as measured by the Federal Reserve Index

Federal Reserve Brings Its Index Of Industrial Production Up to Date

NEW YORK — The Federal Reserve Board is replacing its old (1935-1939 = 100) Index of Industrial Production, in effect since 1923, with a revised index based on 1947-49 = 100.

Reason for the changeover is that the importance of various industries in 1937 no longer holds true, whereas an index based on industries in 1947 provides an industrial figure that corresponds closely to current production.

Although the revised index does not yet cover farm output, construction, utilities, transportation and other trade and service industries, it does give better coverage to manufacturing and mining than before.

The revised index has proved more accurate than the old. For example (1) it has recorded a 38% rise in production from January 1947 to July 1953 — the old index showed an increase of only 29%; (2) the peak of the recent production boom according to the revised index was reached in late spring and summer of 1953 — corresponding exactly to what actually happened. But the old index indicated that peak production was reached in March 1953 and that production has been on a downtrend since; (3) the revised index shows that the decline from peak output centered in the August-September period, but the old index showed a gradual decline from April to November 1953; and (4) the revised index shows that output did not fall as far during the 1949 inventory recession as the old index showed. According to the new index, production dropped only 10% from October 1948 to July 1949, not 18% as shown by the old index.

The new index is made up of 175 basic monthly indexes, incorporates 38 new industrial groups for the first time. The old index used only about 100 sub-indexes.

And each industry is better represented in the new index. This is particularly true in metalworking, which was formerly based on one factor only — manhours worked. Under the new index, metalworking figures are based on seven separate manhour factors, plus 12 physical quantities.

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Hy-Pro centers its operation on solving tap problems . . . problems which can cost you time and dollars. Because taps are Hy-Pro's important line, they continually concentrate their research and creative staff at analyzing and improving every phase of tap use. The result has been their proven reputation in production circles as the "Tap Specialists."

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Newcastle 1-6486

Metalworking Abroad
(McGraw-Hill World News)

RUMANIA — Steagul Rosu, Rumania's first ball-bearing plant, doubled its 1950 output of ball bearings in 1952, and has turned out all ball bearings called for under its current five-year plan two years ahead of schedule.

FRANCE — Two Grenoble firms, Neyret-Beylier and Picard-Pictet, have just completed construction of a 1000-ton-capacity press brake, largest ever constructed in France. The brake is of all-welded construction, fabricated from 5/8-in. plate and will be used to bend 1 3/8-in. steel plate through 90 degrees at a Yugoslav metalworking plant.

ITALY — Fiat plans to build a new tractor plant in Naples as part of the Cassa del Mezzogiorno plan to industrialize South Italy.

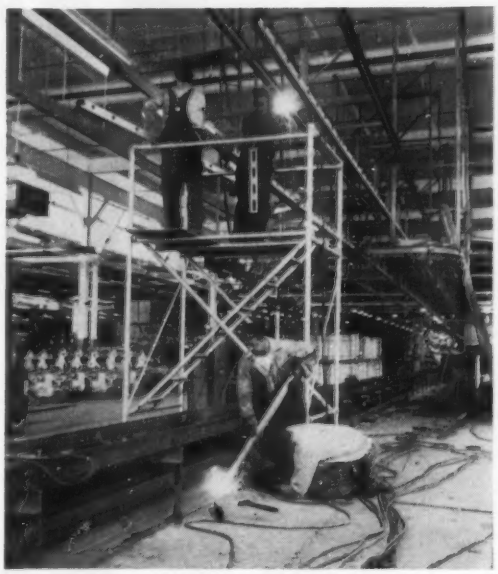
BULGARIA — This country's first steel plant, producing both basic steel and rolled metal, has been dedicated at Dimitrovo, near Sofia, and will form the nucleus for Bulgaria's largest industrial center.

EIRE — The government has approved outlay of 10.5 million pounds for re-equipping the nation's railroads. Of this, 5-million pounds will be spent on diesel locomotives, 3.5 million pounds on new coaches.

RUSSIA — The official government newspaper, Izvestia, has accused the Ministry of Machine Building of failure to organize production of well-constructed textile trimming equipment.

ITALY — Exports of machine tools in third quarter 1953 were 2590 tons, as against 2231 tons for the second quarter. Non-electric motor and engine exports were 2590 tons in the third quarter, against 2231 tons in the second quarter. Also showing slight increases over the second quarter were exports of textile machinery, electric motors, office machines.

INDIA — The Indian government and the German combine of Krupp and Demag will set up a 500,000-ton annual output steel plant at one of four possible sites to be decided this month — West Bengal, Bihar, Orissa or Madhyapradesh.



ASSEMBLY LINE ADDITIONS at Dodge's San Leandro, Calif, final assembly plant, will bring certain separate assembly operations into powered straight-line production. Additions included a 210-ft extension to the passenger car assembly line, a 55-ft addition to the truck line

"Realistic Depreciation" Advocated By New MAPI Publication

WASHINGTON — A more realistic depreciation policy—one that takes into account the importance of correct depreciation allowances with relation to the current budgetary problems facing government — is advocated in Machinery & Allied Products Institute's newly published pamphlet, "Realistic Depreciation Policy."

The pamphlet's primary purpose is to make the results of MAPI's intensive researches into depreciation policies available to both legislators and businessmen at a time when Executive and Congressional decisions on tax reforms are imminent.

Three Primary Aims

The pamphlet's subject matter may be divided into three broad classifications:

- Specific recommendations on depreciation reform for consideration by Congress and the administration on reappraisal of tax policy.
- An analysis of depreciation from the standpoint of internal management policy, as opposed to depreciation policies based on tax policies. The study analyzes capital consumption and allocation of cost of production over asset life, as a basis for decisions on such facets of management policy as pricing, production, dividend distribution, financing, etc.
- An analysis of the inroads that an incorrect depreciation policy can, through excessive tax levies, make on funds available for investment. (According to MAPI: "The current understatement of depreciation, amounting to some $7 billion annually, is in essence an erosion of capital, the correction of which can be an important factor in stimulating a strong and continuing level of capital goods purchases.

"Realistic Depreciation Policy" is the fourth work in MAPI's campaign for a new depreciation policy, begun in 1949 with publication of "Dynamic Equipment Policy." Sequels since then have been the "MAPI Replacement Manual" and "Company Procedural Manual on Equipment Analysis." The present volume is designed to reappraise existing depreciation practices, both for managerial and tax purposes, from a fresh point of view.

An idea of just what this fresh viewpoint comprises is given by MAPI President William J Kelly in the pamphlet's forward:

"Neither management nor investors have anything to gain in the long run from make-believe and illusion. The cost of capital consumption cannot be exorcised by disregard or reduced by understatement . . . a better accounting of this cost should yield more informed and intelligent decisions on many matters.

The Big Difference is in your PROFIT!

You can see at a glance that the new Leland-Gifford Drilling Machine is equipment any shop would be proud of — inspiring operators to do their best and lending a look of modern efficiency to the plant.

Heavier and more rugged than the old drilling machine; it has individual motor drive in place of the belt drive; radial and annular thrust bearings instead of plain thrust bearings, oil mist lubrication replacing open lubrication and multi-spline spindles where single spline spindles were used.

But the big difference is in your profit. Today's pace demands faster production and greater accuracy. Modern Leland-Gifford Drilling Machines have what it takes not only to keep you ahead today, but to enable you to operate at a profit in the face of even higher standards which may be expected tomorrow.

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Eisenhower Backs Proposal to Liberalize Tax Depreciation on Plant and Equipment

WASHINGTON — Manufacturers would be permitted to write off two-thirds of the cost of either machinery or buildings during the first half of their useful life in proposed Congressional legislation which will have the open backing of the Eisenhower administration.

Gabriel S Hauge, the President's economic assistant, and Arthur F Burns, chief of the Council of Economic Advisors, are reported to be masterminding the plan. They feel that the national economy is strong enough at this time that it is not necessary to liberalize tax depreciation policy more than they have advocated.

They point out that the Commerce Dept estimates that investment in new plant and equipment in first quarter 1954 still will be high without benefit of any new amortization policies at all.

Has Plenty of Backing

The administration's plan is regarded as a certainty, as all major officials and agencies involved are said to have agreed to it. At the outset, as a result of the new depreciation policy, government revenue will drop temporarily. The White House, however, feels that any revenue loss for the time being is secondary to the additional incentive to industry to invest in new capital goods. The loss will be more than made up later on as manufacturers begin paying taxes on higher earnings after the large initial write-offs have been taken.

Too Mild, Some Say

Ardent advocates of more liberal depreciation policies feel that the administration's plan only goes halfway. They say that the charging of two-thirds of the cost of new equipment in half the useful life gives the manufacturer only a relatively small advantage over what he has today. On a $10,000 piece of equipment with a life of 10 years, for instance, he would be able to accumulate $6666 to replace it—as compared with the $5000 he can charge off under present law and Bureau of Internal Revenue regulations.

The question then becomes: is the difference between $5000 and $6666 enough of a "shot in the arm" to make any difference one way or the other? Most proponents of freer amortization policies, including the Machinery and Allied Products Institute claim that it isn't.

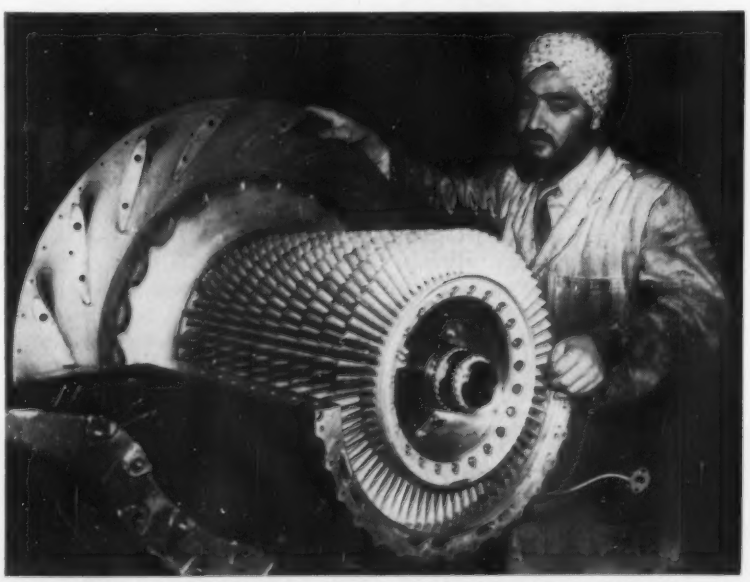
More liberal proposals than the White House plan undoubtedly will figure heavily in Congressional consideration of legislation. One of these proposals permits half the cost of capital equipment to be written off in the first five years—no matter what the useful life is.

However, the metalworking industry will get a psychological boost out of the administration's amortization formula, which is close to the one long advocated by MAPI—the declining balance idea. (See page 280). But there is no sign yet that Eisenhower's aides have adopted the other major MAPI recommendation —that the rules he changed to compensate for rising prices, a factor of considerable importance during the last few years.

Nevertheless, adoption of such legislation will be a foot in the door to further liberalization if and when the administration sees the need for it. In fact, a further liberalization is promised by the very arguments used to support a small change now. In other words, Hauge and Burns say, the increase in amortization allowances should purposely be kept small because the need is small. But if the need increases, then the policy would be re-liberalized.

The machine-tool industry has advocated, in proposals to Congressional committees and to Treasury Dept officials that Section 23 (1) of the Internal Revenue Code be amended to permit optional depreciation for "durable, productive equipment" bought after December 31, 1952. Under this proposal, an equipment user would be authorized to write off all or any part of the cost of new machinery in the year in which it is acquired and placed in operation. The balance of the cost would be written off over subsequent years as the taxpayer elects.

Under this plan, the industry recognizes that at the outset it may be necessary to limit first-year depreciation allowances to perhaps 50% of cost. However, it emphasizes that the first-year write-off should not be less than 50% on machine tools and equipment—or part of the benefit would be lost.

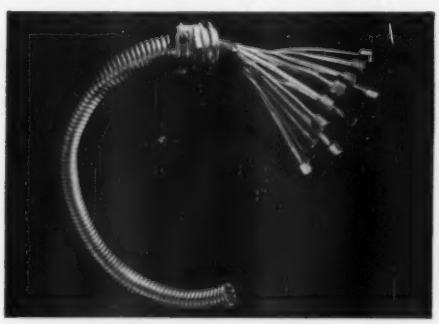


TURBAN AND TURBINE make an exotic combination at England's Air Service Training Ltd, where Dalip Singh Dillion, a Sikh from Kenya, is completing a course in maintenance of civil aircraft. Engine is a Bristol Theseus turbo-prop

For the new pneumatic instrumentation

Cabled Tube

The recent tremendous increase in the use of tube instead of wires for instrumentation and control purposes has led to an important new development—cabled tube. This is an armored group of long tubes twisted together to permit bending without distortion. An insulating tape is wrapped over the bundle of tubes to prevent electrolytic action. Then interlocking, flexible galvanized steel armor is applied, like BX. This protects the tubes from injury during shipment, storage, installation, and in service. Standard fittings, boxes and cabinets can be used for junction boxes and terminations. To make it possible to readily identify each tube, one tube in each layer is colored; the position of each tube in each layer in relation to the coded tube

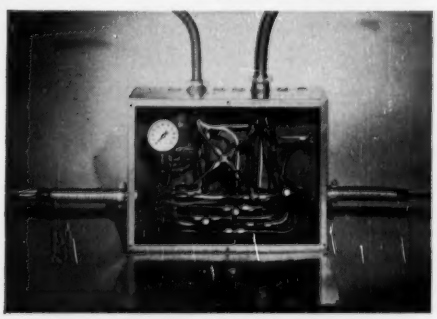


remains the same throughout the length of the cable.

The tubes usually are copper, but aluminum tubes can be used for special purposes. For unusually corrosive situations, a plastic outer sheath can be applied. As many as 19 tubes, ¼" OD, can be cabled, and supplied in lengths up to 1,000 ft.

Showing the construction of Crescent Armored Multitube, made by Crescent Insulated Wire and Cable Co., Trenton 5, N. J., which will supply further information on request.

Since the tubes carry not electricity but air, nitrogen, helium, or a fluid, they are especially attractive in potentially explosive locations, as in refineries and chemical plants. Utilities are also turning decisively to this new cable, while automatic process control (automation) is a rising application.



Revere, as a supplier of tube for this purpose, calls this cabled tube development to your attention as a matter of general and perhaps specific interest. See Revere for copper, aluminum and brass tube and pipe, electric welded steel tube, and lockseam tube. Call the nearest Sales Office.

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What's In Store for Aircraft Manufacturers In '54? Gradual Tapering of Output Says AIA

WASHINGTON—Production of both military and commercial aircraft will taper off gradually in 1954, according to a year-end statement issued by Admiral DeWitt C Ramsey USN (Ret), president of the Aircraft Industries Association.

Although, according to Admiral Ramsey, it is difficult to forecast the 1954 level of aircraft industry activity, unit production of military aircraft will remain at present levels —about 1000 planes a month—for several months. Then it will taper off gradually so that by 1954's end military aircraft production will be appreciably lower than at present.

Second Quarter Peak Output

On the basis of airframe weight, output will peak in the second quarter, then it, too, will drop off.

A decline in commercial aircraft production is expected in 1954 despite anticipated increases in air passenger travel and air freight movements. But more utility aircraft and commercial helicopters are expected to be sold in 1954.

Aircraft industry employment in 1954 is not expected to exceed 775,000 at its second quarter peak, and will gradually drop off to around 725,000 by year's end.

But in spite of anticipated declines in both military and commercial plane production, aircraft manufacturers expect sales to closely approximate 1953's $9 billion, with sales volume of the nation's top 12 airframe producers expected to be close to $5 billion.

Subcontracting to Decline

Continued curtailment of large scale subcontracting since the Korean peak is in prospect for 1954. More and more prime producers will perform their own work as production rates are cut back.

Also in prospect for 1954 is greater striking power for the military arms; planes with greater performance capabilities, including at least four new jet fighter models scheduled to reach full production; increased jet-bomber output; and first deliveries of turboprop transports to the military.

Last Piston Bomber in '54?

Production of jet aircraft, unlike that of propeller craft, will continue to increase and by year's end may make up 75% of all military aircraft output. One prediction: 1954 will see delivery of the last piston-engined bomber.

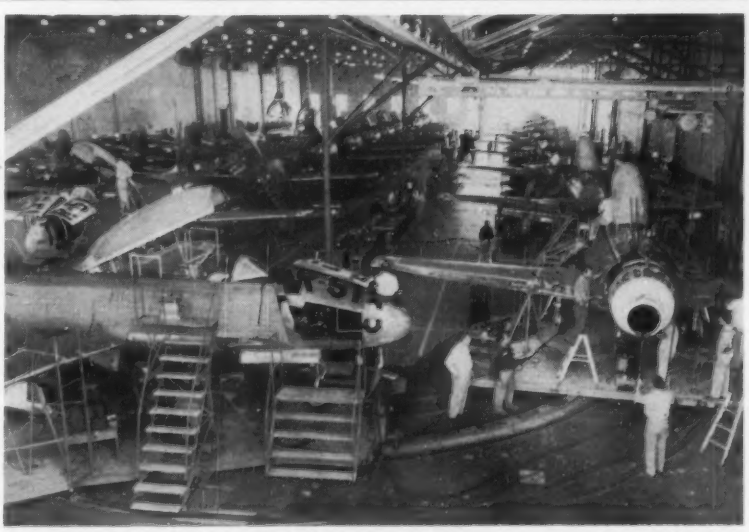
Aircraft Industries Association, recognizing that as air rearmament peaks are reached and level of productivity drops steps must be taken to insure that the industry's effectiveness is not dislocated, has developed a four-point national air policy program designed to keep development and procurement of aircraft abreast of existing conditions at all times:

- Maintenance of a strong and active program of research and development, irrespective of periodic fluctuations in the international situation. Such a program should use the full competitive values of a resourceful aircraft industry.
- Maintenance of a sufficiently broad production base within the industry to permit rapid expansion in the event of an emergency.
- Maintenance of a going rate of production sufficient to hold together an important nucleus of engineering and production teams and to provide the military services with the best weapons.
- Recognition of the vital importance to national security of a healthy, stable private aircraft industry financially strong and unhandicapped by a policy which limits its profits to less than half the national industrial profit average.

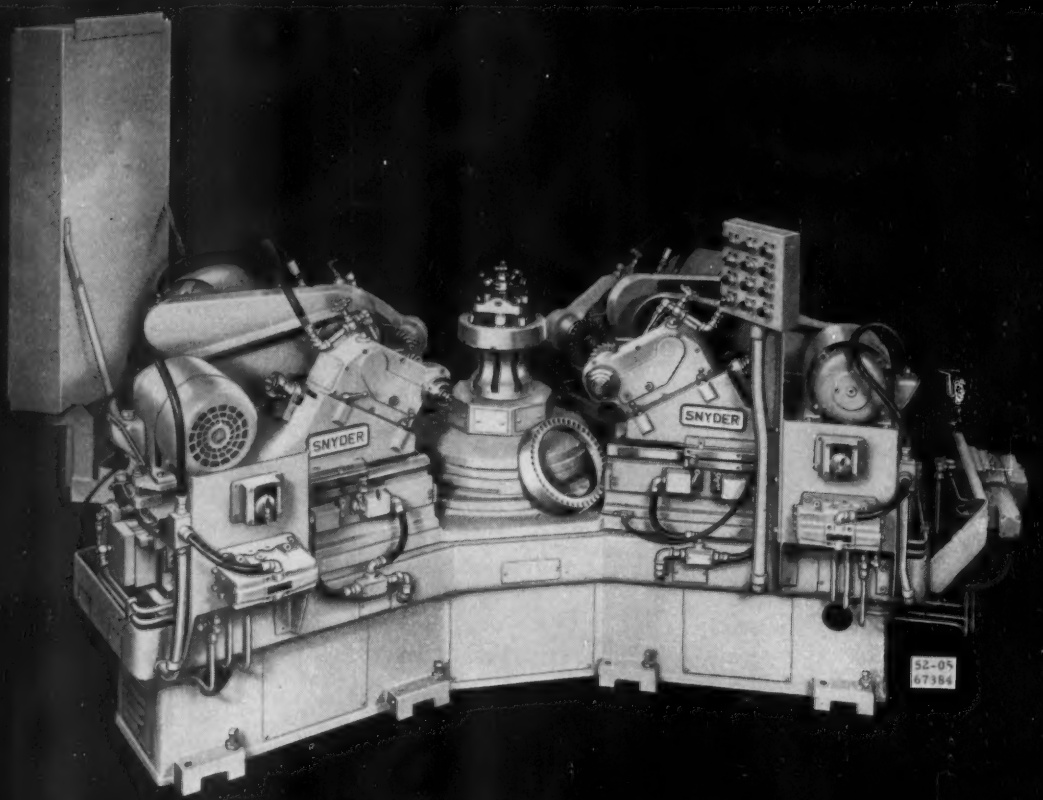
CHRYSLER BUYS BRIGGS AUTO BODY FACILITIES

DETROIT—Chrysler Corp acquired body building facilities for its entire output of Plymouth cars with purchase of Briggs Manufacturing Co's 10 plants in this area, stamping plant at Youngstown, Ohio, and body assembly plant at Evansville, Ind, for $35 million. Purchase price included plants, machinery and equipment. The newly acquired facilities will be known as Chrysler's Automotive Body Division. More than 30,000 Briggs employees will transfer to Chrysler payrolls under the transaction.

Because of unresolved transactions between Briggs and Boeing Airplane Co, Briggs aircraft defense sub-contracting will not be transferred to Chrysler at this time. Thus Briggs will continue its defense work as a tenant in the Mound Rd and Outer Drive (Detroit) plant.



NON-STOP PRODUCTION OF T-33 JET TRAINERS is accomplished at Lockheed Aircraft Corp's Van Nuys, Calif, plant with this new final assembly line, said to have lopped 3000 manhours per month off production time. The 725-ft-long line is oval-shaped, has 22 assembly stations, cost only $60,000



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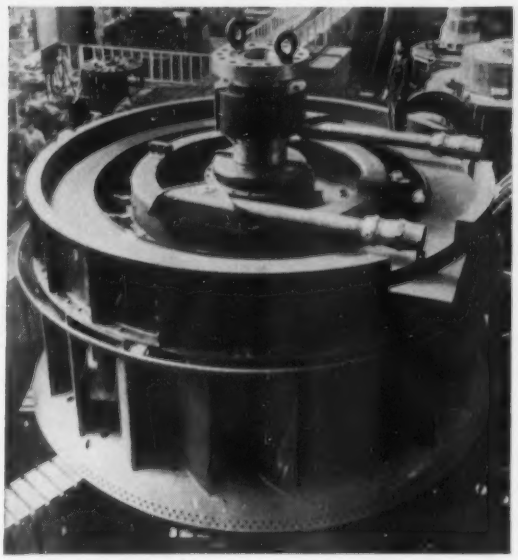
CHICAGO FIRM HELPS FBI NAB DRAFT GRAFTER

CHICAGO—Officials of the Onsrud Co helped the FBI to lay a trap to catch a local draft board head red-handed with $300 bribe money in his pockets early last month.

Onsrud's vice president Ray C Reinhartsen and personnel manager Philip Pedersen had sought a draft deferment for two German immigrants on grounds that they were skilled machinists employed on defense work. The draft board head phoned to say the deferment could be arranged "provided we can get some entertainment out of it."

Pedersen and Reinhartsen promptly informed the FBI, were told to play along, met the draft chief in a restaurant, paid him $300, and watched the FBI nab him a few moments later with the bribe on him.



JAPAN'S LARGEST water-wheels get finishing touches at Hitachi, Ltd. One of two 30,000 kw, 36.1-meter dia wheels, this will be installed at Honna Power Station

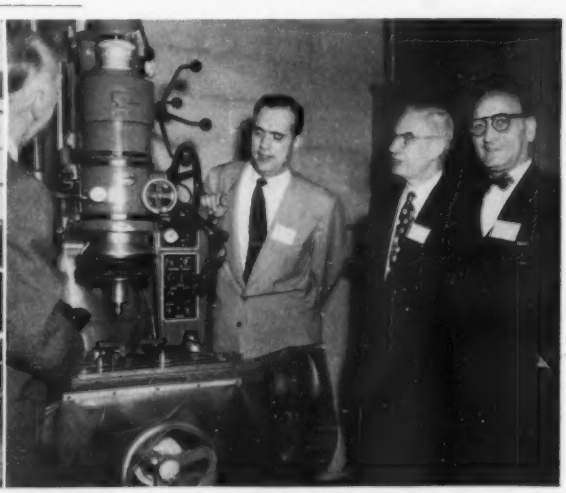
Lodge & Shipley Acquire Columbia Machinery & Engineering

CINCINNATI—Lodge & Shipley Co, makers of lathes and turning equipment, has acquired the Columbia Machinery & Engineering Corp, Hamilton, Ohio, manufacturers of shears, power press brakes and metal forming presses. The acquisition through merger was approved by both companies' shareholders at meetings held in Cincinnati and Hamilton December 21. Lodge & Shipley stock will be listed on the American Stock Exchange in lieu of Columbia, which is retired by the merger.

Acquisition of Columbia by the 62-year-old Lodge & Shipley Co will broaden and diversify the latter's metalworking equipment lines and will pave the way for its expansion into other fields, notably manufacture of hydraulic presses for the woodworking, plastics and fiber industries. These presses have been made by Columbia since its inception in 1942.

Under the merger agreement, directors who will serve on the board of Lodge & Shipley are: Joseph V Delaney, William L Dolle, George E Fee, Walter F Grote, Thomas T Kling, Lawrence H Kyte, Allen W Merrell, Ralph W Miller, J Herbert Myers, James B O'Donnell, John R Queen, Alfred Schwarzenbach, James A Walsh and Louis B Weber.

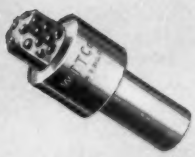
Operations will be continued at both Cincinnati and Hamilton without interruption and no change will be made in management or personnel. The Hamilton plant will be renamed the Columbia Division of Lodge & Shipley Co.



OPEN HOUSE AT NEW FLUSHING, NY, PLANT of August W Holmberg Co drew top executives from a variety of industries served by the 53-year-old die and stamping firm. Left: President Centre W Holmberg and Factory Superintendent Albert Craz inspect a blueprint in the company's modern toolroom. Right: officials of Thomas A Edison, Inc, left to right: Ewald Heine, Edward Heine, Henry Carlson and Gustav Dombo look over one of Holmberg's new precision jig grinders installed in the company's new Flushing plant

RADIUS FORMING TOOLS

"TRU-LINE" PROFILE DRESSING TOOLS



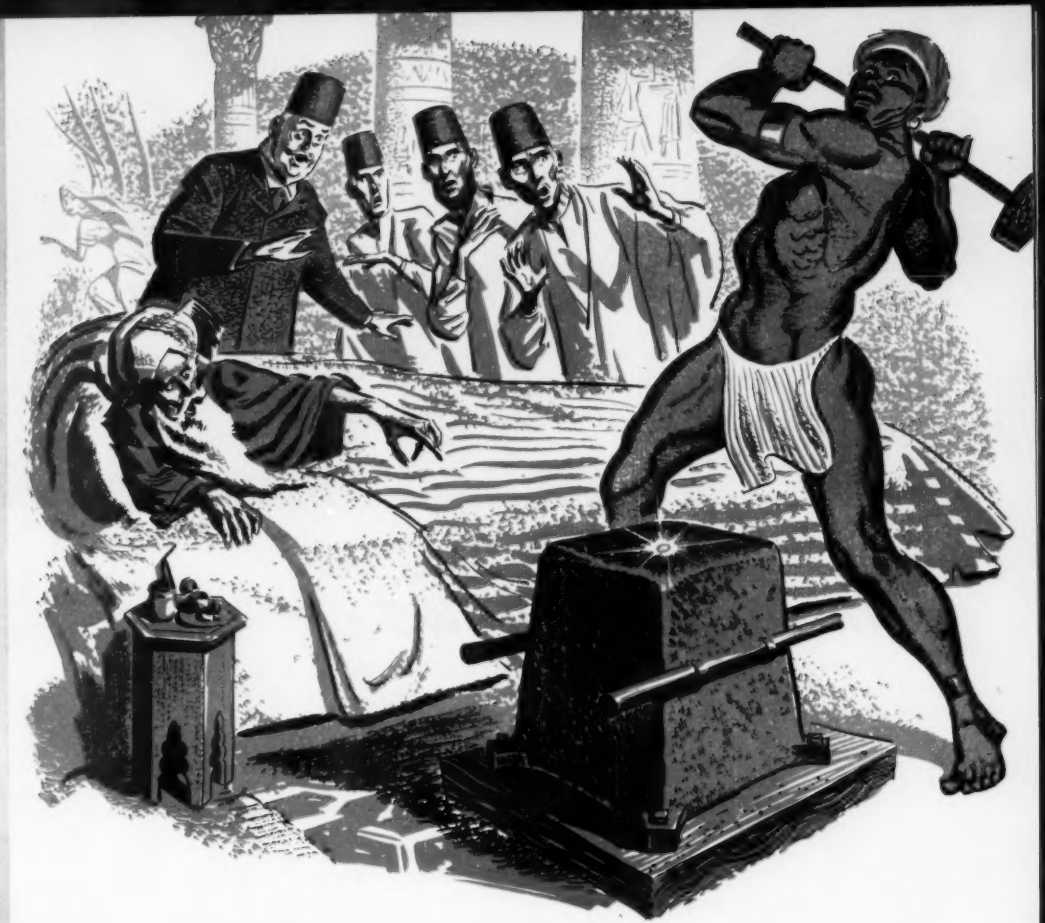
IMPREGNATED DRESSING TOOLS

STANDARD DRESSING TOOLS

"TRU-THREAD" THREAD DRESSING TOOLS

DIAMOND GRIT TOOLS FOR THREAD DRESSING

INDUSTRIAL DIAMONDS



"Smash the Great Diamond, Before My Eyes!"

Vasilica was undoubtedly one of the most beautiful women in the whole world. Ali Pasha, Khedive of Egypt, was sure of it, and for such a treasure, what gift more fitting than this great diamond!

Treasured for centuries by Indian princes, it had been presented to Lord Piggott when he was Governor of Madras. When he died in 1770, it had been sold for $50,000 to a London pawnbroker who organized a lottery for the "Great Piggott Diamond" and saw it won by a poor clerk who quickly sold it and disappeared.

Recut to dazzling brilliance, it was presently offered to Ali Pasha who happily paid $150,000 for it and said, "Now, I have *two* great treasures—Vasilica and the great diamond."

But, Ali Pasha also had a deadly enemy, Raschid Pasha, who hated him and coveted his treasures and whose trained assassins awaited—and struck.

Realizing that his beloved treasures might now fall to his enemy, Ali gave one last command: "Smash the great diamond—before my eyes, and my dear wife, let her be strangled." But, while the slave was hammering the jewel to dust, Vasilica quietly slipped away and escaped.

Diamonds have played many such dramatic parts in the pageant of history, but today their greatest role is in the field of industry. And, for 43 years we have been serving industry by importing fine diamonds and making fine diamond tools. Our field engineers are at your service.

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E F Carney

Horace E Wood

Edward C Logelin

J Lawrence Buell, Jr

Names in the News

E F Carney has been elected vice president and general manager of the Geometric Stamping Co, Cleveland. Chairman of the Board **Dave R Jones** was named president, an office he held from 1915 to 1950. Mr Carney joined the company in 1929; he has served as chief engineer, assistant to the vice president in charge of sales, assistant to the president, vice president and factory manager, and in 1946 was made vice president, sales. **Clarence W Seik** has been named treasurer and secretary; **R C Barker** is assistant secretary-treasurer.

Horace E Wood has been appointed Far Eastern manager of the newly-incorporated Niigata Worthington Co Ltd, Tokyo. Worthington Corp of Harrison, NJ, has associated itself with the Niigata Engineering Co, Japanese manufacturers of heavy machinery and capital goods; the new company will manufacture and sell many lines of the American firm's products.

John S French has been appointed assistant general manager of Ford Motor Co's Parts & Equipment Mfg Div. Associated with the company since 1947, Mr French was formerly director of the Office of Defense Products.

Edward C Logelin has been appointed vice president of US Steel Corp, Chicago District, to succeed **Arthur C Wilby,** retired. Mr Logelin joined the organization in 1930; for the past seven years he has been director of public relations.

Frank Masterson, assistant to the president of the Anderson Co, Gary, Ind, has been elected president of Industrial Fasteners Institute, Cleveland, Ohio. He succeeds **Herman H Lind,** who has headed the organization for seventeen years. Mr Lind will re-establish in Cleveland the consulting and negotiation service for purchase and sale of businesses in which he was engaged before entering trade association work.

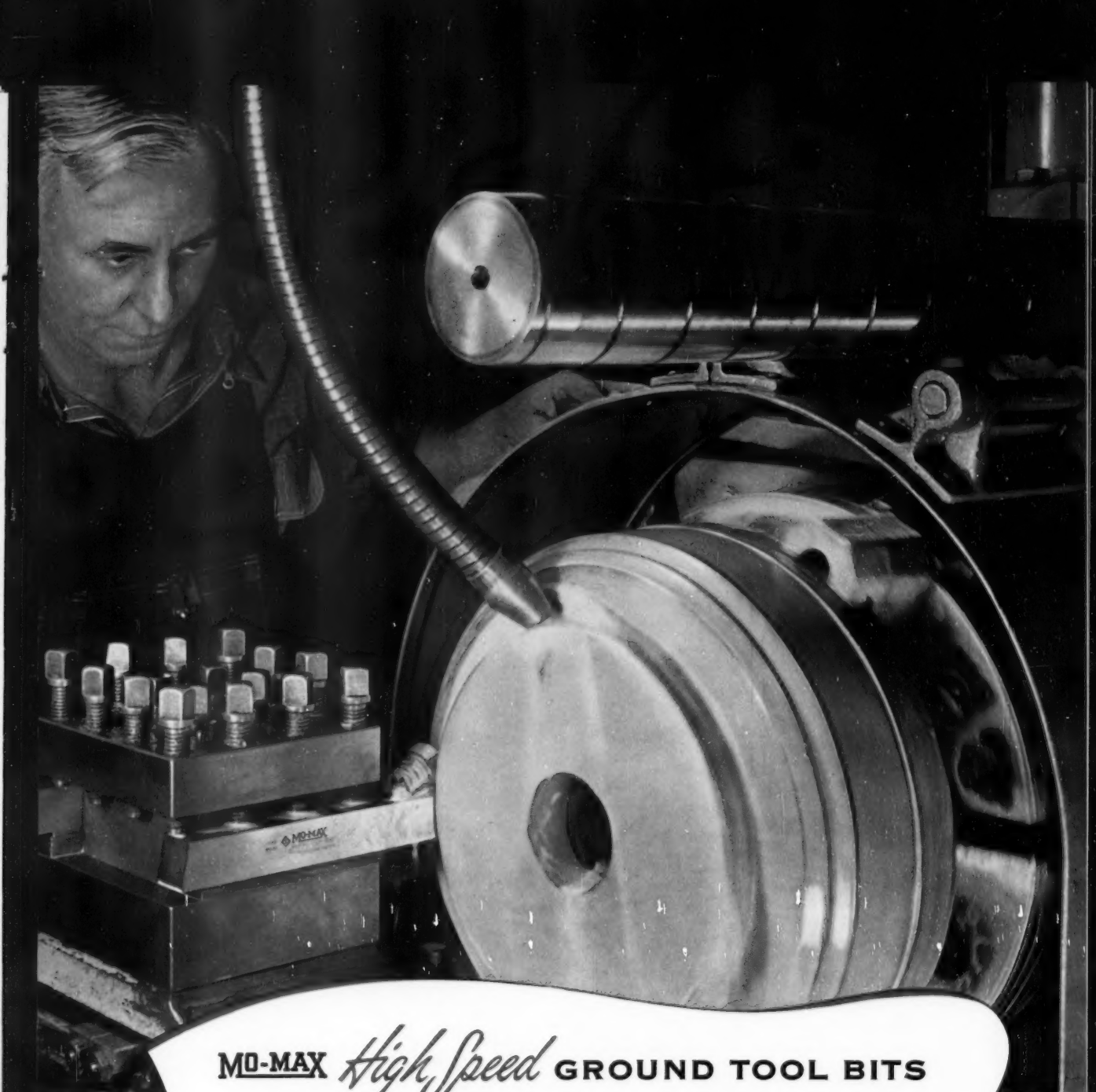
Jack L Mustard has been appointed assistant general sales manager of Ex-Cell-O Corp's Industrial Div. He moves up from his post as assistant sales manager of the precision products division.

J Lawrence Buell, Jr, has been elected president, general manager, and director of the Formsprag Co, Van Dyke, Mich, following the resignation of **Shepard Barnes.** Mr Buell has been associated with the Reliance Electric & Engineering Co, Cleveland, for the past 26 years in sales and engineering capacities; he has been manager of the Detroit district since 1936.

Wallace R Persons has been elected president and a director of Emerson Electric Manufacturing Co, St Louis, Mo. He takes over the post held by **W S Snead,** who has been serving as both president and chairman of the board; Mr Snead will continue to head the board. Mr Persons has been vice president and general sales manager of the Lincoln Electric Co of Cleveland for the past seven years.

C Larry Donlon has been named vice president and general manager of the Welker Machinery Co, Detroit. He has been sales manager of the firm since 1947.

R G Faverty (right) has been made managing director of a new power tool factory, opened recently at Tynemouth, England. Destined to become the largest of its kind in Europe, the plant is owned jointly by the United States and England, and is a branch of the English engineering firm of Armstrong-Whitworth. The American head of an all-British staff shows Britain's Minister of State for Overseas Trade, **D Heathcoat-Amory,** some of the power tools made at the plant. A part of its output will form a contribution to Europe's defense.



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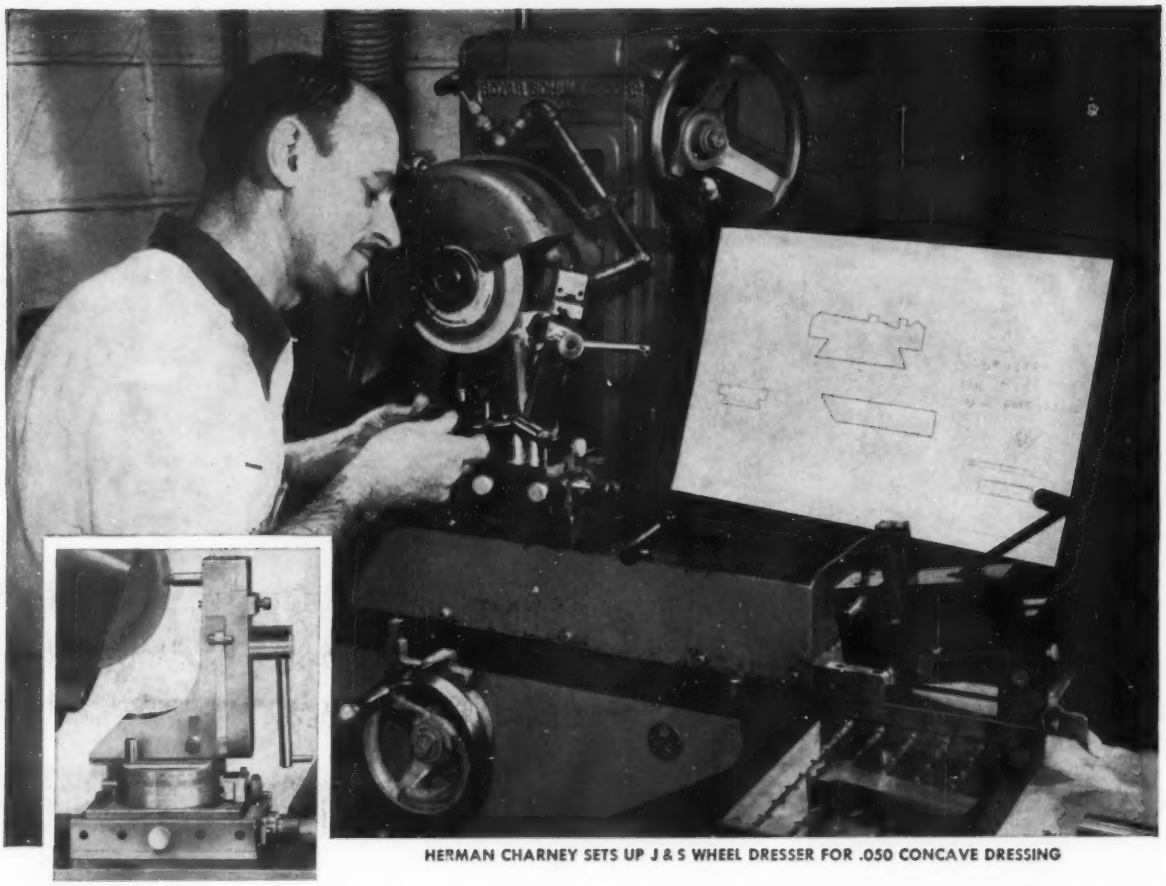

HERMAN CHARNEY SETS UP J & S WHEEL DRESSER FOR .050 CONCAVE DRESSING

Saves hours by setting angles in seconds, radii in minutes

A typical job made easier with a J & S "Fluidmotion" Wheel Dresser

Here's a wheel dressing job which calls for 13 angles, 4 radii, 7 flats. Ordinarily you might expect to spend from 5 to 30 minutes for each setting. With a J & S "Fluidmotion" Wheel Dresser, tool grinder Herman Charney made *all* 24 settings in just 21 minutes.

Time-saving Features

An unusual case? No — it's typical of the speed and ease of operating a J & S Wheel Dresser. Setting 2 angles with a "Fluidmotion" Dresser, for example, takes only 10 seconds. Setting a radius takes only 2-3 minutes.

Note just *how* easy it is to operate a J & S Wheel Dresser. All you need is a micrometer and a simple hex wrench. You can forget about gage blocks, height gages and master gage settings. No need to bother either with parallel bars, surface plates or dial indicators.

With the "Fluidmotion" Dresser, you can also dress two angles tangent to a radius in one continuous motion. After dressing the angles, the diamond automatically returns to center.

Accurate to 0.0001"

Accuracy? You can make concave and convex contours at a full 180 degrees with a guaranteed accuracy of 0.0001". J & S dressed forms, too, are always clean and precise. Angles and radii *flow* into each other, free of tool or chatter marks.

These are some of the benefits you get when you use a J & S "Fluidmotion" Wheel Dresser. A variety of models are available for dressing wheels up to 24" in diameter. Construction in all cases is of high-carbon, high-chrome steels.

Write for complete information today.

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Now for the first time, all the advantages of direct drive and automatic cycle have been incorporated in an oil hydraulic piercing type extruder . . . without sacrificing speed or cycle time.

This press, designed for the copper and brass industries, has a maximum billet length of 27" and will extrude 60 billets per hour. Press, without runout table, measures 56' long, 12'6" high and 17'9" wide. Total weight is approximately 480,000 lbs.

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Edgar D Leon

William J During

Ralph H Behrend

Walter C Thompson

Names in the News

Edgar D Leon has been elected president and director of the Gear Grinding Machine Co, Detroit. For the past three years Mr Leon has owned and operated the Hickory Pattern & Foundry Co in Detroit. Prior to that he had been associated with Chrysler Corp for ten years, and with Aluminum Alloys Corp.

William J During has been elected president of Precision Castings Co, Fayetteville, NY. Former President **Arthur G Chase,** associated with the company since 1923, and its head since 1947, has been named chairman of the board and chief executive officer. Mr During joined the organization in 1923 as chief engineer and has served successively as vice president, executive vice president, and a director.

Wayne G Norton has been appointed general sales manager of Optical Gaging Products, Rochester, NY; for the past twelve years he has been associated with Eastman Kodak. **John A Bernardini,** formerly district sales manager, will assist Mr Norton.

Walter F Deming has been elected president of the Deming Co, Salem, Ohio, succeeding his father, **G Ramsden Deming,** who died Dec 5. The new president has been associated with the organization for the past 21 years and has served as treasurer since 1942. **E S Dawson,** in charge of factory operations, and **H E Carloss,** director of sales activities, have been made vice presidents; **Wilson J Morlan** has been named secretary-treasurer.

Ralph H Behrend has been appointed manager of Hydraulic Press Manufacturing Co's C-frame press sales. Prior to joining the firm Mr Behrend was superintendent of the tooling division of Denison Engineering Co, Columbus, Ohio. During his 36 years of experience in the tooling field he has been associated with Chicago Pneumatic Tool Co as chief tool engineer; headed National Acme's special tool department; and served as general superintendent of Black & Decker Electric Co.

Robert K Beck has been elected president of Apex Smelting Co, Chicago. Formerly vice president and general manager, he succeeds **W A Singer,** president of the company since its formation in 1923, and now chairman of the board.

A L Foscue has been appointed president of Electro Metallurgical Co, and US Vanadium Co, divisions of Union Carbide & Carbon Corp. He succeeds **Walter E Remmers,** named chairman of both boards, and a member of the appropriations committee of Union Carbide, of which he is a vice president. Mr Foscue has been a member of the organization since 1924 and vice president of Electro Metallurgical since 1951.

Marvin Bowman, sales manager of Modern Tool Works Ltd, Toronto, has been elected president for 1954-55 of the Canadian Machine Tool Builders' Associated. **A R Davidson** has been named vice president; **C H Stabler,** secretary; **Colin Boggs,** treasurer; and **W H Stirling, J T Hepburn, Jr,** and **A E R Turner,** members of the executive committee.

Walter C Thompson has been elected president of the Torrington Co, Torrington, Conn, to succeed **Lester J Ross,** who died Nov 14. **Ray B Nichols** takes over Mr Thompson's post as executive vice president, and **Byron T Virtue,** chief engineer of the Bearings Div, has been promoted to general sales manager. Mr Thompson, affiliated with the company since 1927, was made vice president, sales, in 1944 and executive vice president last September.

John E Martin has been named president of the Dana Corp, Toledo, Ohio. He succeeds **Ralph E Carpenter,** president since 1948, who moves up to the newly-created post of vice chairman of the board. Mr Martin resigned as president of Firestone Steel Products Co, Akron, to join Dana as executive vice president in March 1952.

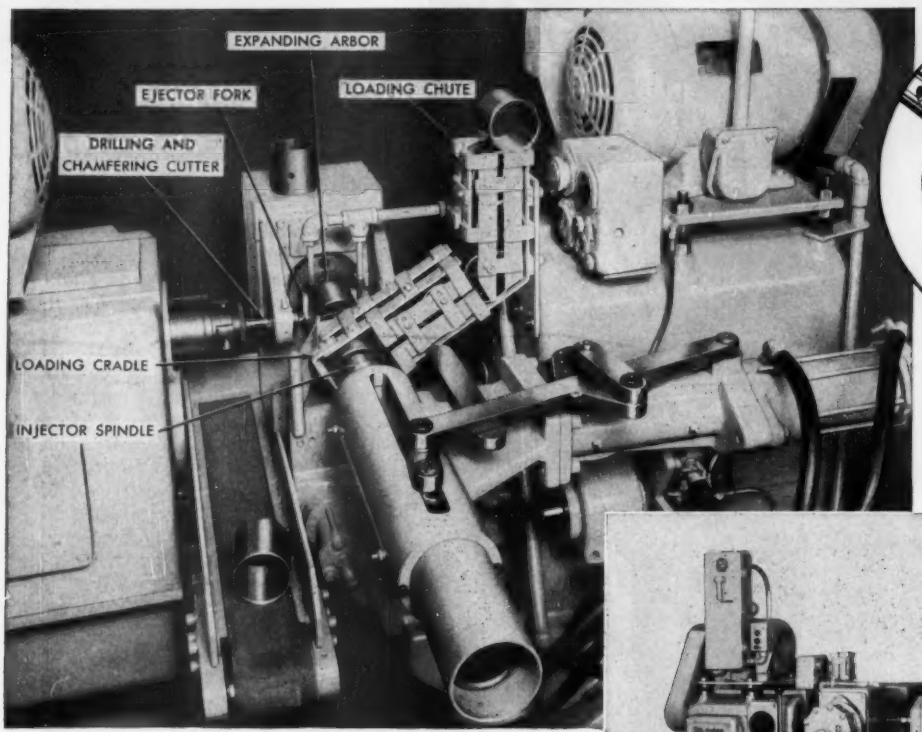
OBITUARIES

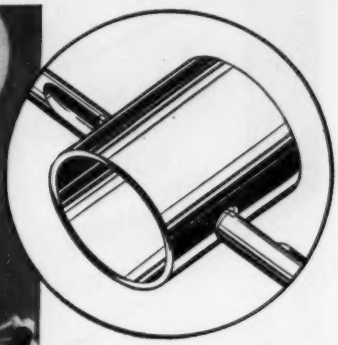
Palmer J Lathrop, 44, president of the Cameron Machine Co, Brooklyn, NY, died Dec 26. Prior to joining the company in 1949 as assistant to the president, Mr Lathrop was vice president in charge of production for Bristol-Myers, Hillside, NJ. He was appointed chief executive of Cameron in July 1949, following the death of President Harold Kinsey.

Albert G Lindsay, manager of Rockwell Manufacturing Co's Export and International Divs, died Dec 4 in New York. Former manager of Crosley Corp's Foreign Div, Mr Lindsay joined Rockwell in April 1953 and made his headquarters in Pittsburgh.

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

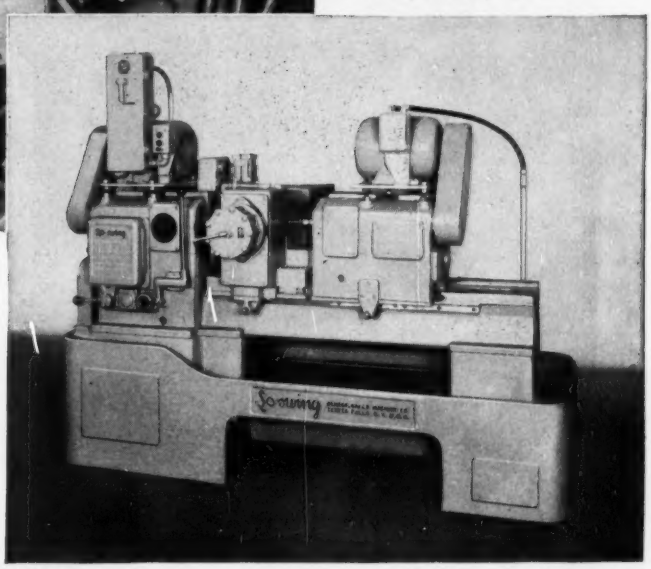




▲ *Schematic diagram showing application of two combination Drilling and Chamfering Cutters to work.*

◀ *Closeup rear view of machine with safety cover removed to show automatic loading mechanism.*

▼ *Overall front view of machine.*



MODEL "CS" AUTOMATIC DRILLING MACHINE DRILLS SMALL MOTOR FRAMES AT FAST PACE

Problem: **To automatically load, drill and chamfer two holes at 180° and automatically eject small motor frames.**

Solution: **The Model "CS" Automatic Drilling Machine selected for this job was equipped with two Drilling Heads and a combination holding, loading and ejection mechanism shown in upper illustration.**

In operation, the frames, which have been faced to length in a previous operation, are placed in the loading chute and fed by gravity to the loading cradle where they are picked up by the injector spindle and placed on an air-operated expanding arbor. The injector then retracts to clear the work and the two combination drilling and chamfering cutters advance in rapid traverse to the work piece; then slow down for the length of cutting stroke and finally return in rapid traverse to the starting position. The finished piece is automatically ejected by the ejector fork and falls on a moving conveyor which carries it to a tote box, and at the same time keeps the machine clear of chips.

The entire operation is automatic and controlled by cams mounted on a camshaft which synchronizes all machine and loader movements. The loading and unloading takes place during a short dwell milled in the drilling head cams. The operator simply loads the parts in the loading chute, the machine takes over from this point. Production is 600 pieces per hour at 100% efficiency.

Consult Lo-swing engineers about *your* machining problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

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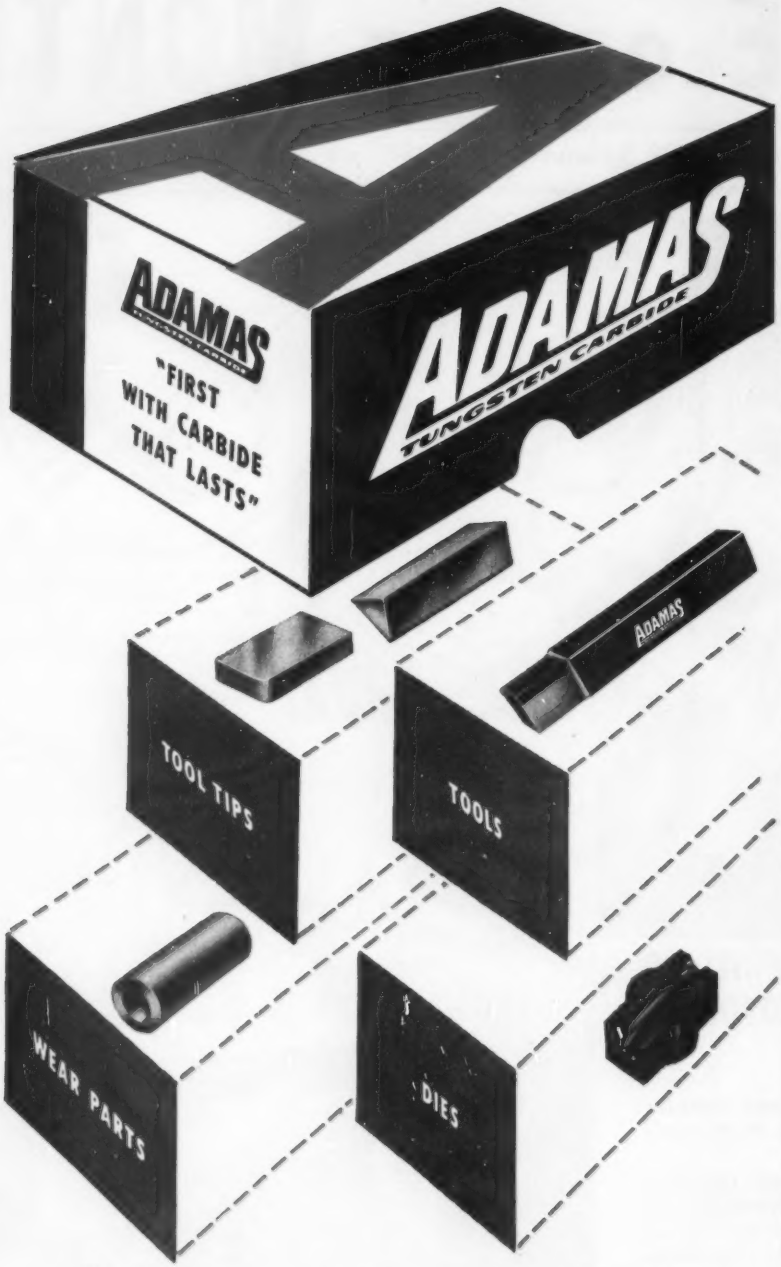

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ROUND TABLE Discussion

PORTIONING OUT THE PIE

How can one worker be paid more than the other men if he is doing additional jobs for the foreman? Is a shop-wide job evaluation system the solution to this problem?

HOW CAN WAGE INEQUITIES between different jobs be avoided and equal pay provided for equal contributions? Nowadays, job evaluation is the most commonly proposed answer.

Job evaluation is a procedure that develops a rating for each job indicating how its contribution compares in value with all other jobs in the firm. It lists the factors that are paid for in all jobs and creates scales or measures for each such factor. Then it rates each job on these scales and summarizes these ratings to provide a composite valuation for each job.

The question whether all men in a given group are worth the same wages has long plagued management. How are you going to allow for differences in skill, effort, and responsibility that different jobs require in terms of equitable wages?

In the case under discussion, Bill Hanson complained to Al that he felt he was not getting enough money for the work he was now doing in comparison to other men in Al's group. Bill was a skillful worker and Al had been supplementing his regular work by assigning him new men to break in from time to time. Bill was justified in claiming that he was worth more to Al than others in the group because the duties of his job had been increased. But the foreman is on the horns of a dilemma in this case. If he raises Bill, he will have the rest of the men on his neck for raises, on the grounds they are doing comparable skillful work and should receive comparable pay. The foreman knows from past experience that raises are contagious. If he doesn't give Bill a raise, he may possibly lose a good worker.

A good job evaluation program will be useful in eliminating many of the evils to which nearly all systems of wage payments are subject; such as inequalities in pay for workers whose duties have been increased, payment of high wages to persons who hold jobs not requiring great amounts of skill and responsibility, paying beginners less money than they are entitled to receive in terms

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Worm Gears up to 150" diameter. Worms to match.

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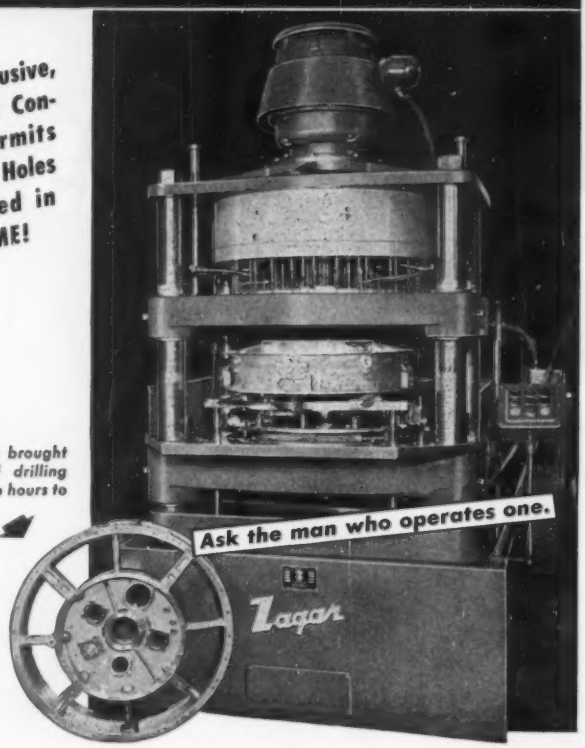
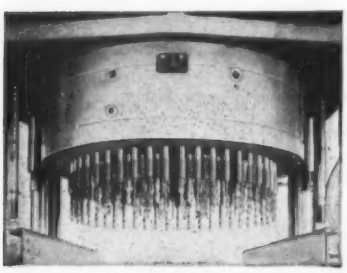
Zagar's Exclusive, Rigid 4-Post Construction Permits Hundreds of Holes to Be Drilled in RECORD TIME!



Zagar engineering brought down the time of drilling this part from three hours to seven minutes.

This jet engine part suggests the almost unlimited possibilities in drilling hundreds of holes at one pass. Zagar 4-post machines are built around interchangeable gearless drillheads. Any number of holes on all centers can be drilled as close as twice drill diameter in any material. Zagar's 4-post machines achieve heavy duty, multiple-spindle, close center drilling. . . with greater horsepower and thrust, with better alignment and accuracy, with less breakage of *small drills*. . . Let our engineers calculate your savings by demonstrating the Zagar method.



Zagar Interchangeable Drillhead.

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Zagar TOOLS FOR INDUSTRY and SPECIAL MACHINERY

of what is required of them, giving raises to persons whose performances do not justify them, deciding rates of pay and increases in pay on the basis of seniority rather than ability, and payment of widely varied wages for the same or closely related jobs.

Some foremen believe that job evaluation was dreamed up by industrial management experts as a wonderful idea for solving wage problems, but which has proved impractical under actual industrial conditions. They argue that such a plan would not be impartial and accurate with so many fingers in the pie. In addition, the paper work and red tape would smother the successful operation of such a program. The foremen would tend to lose control over their departments because of interference of so-called experts in the administration of them. Misunderstanding of the system is evident in such arguments.

Job evaluation is primarily a tool of personal administration, but because it deals with jobs and what is paid for them, those classified as supervisors at every level of the organization should have a clear understanding of how it works. The application of the principles is not confined to the shopworker. In many organizations it includes every employee, from the janitor to the president. It may cover an entire organization or be confined to certain groups of employees within an organization. Moreover, job evaluation is not restricted to organizations of any particular size or type; it has usefulness in any establishment where people work for wages.

The detailed data about every job which is necessary to run an evaluation plan provides information that is useful in hiring new employees, as well as making transfers and promotions; the facts uncovered about jobs may be used as the basis of instruction and desk manuals. The job specifications which are part of its basic

"You'll have to make it quick, Burke . . . others are waiting you know."

information are also basic to employee-rating programs which are designed to judge how well employees fill the jobs they hold. In this same connection, the system goes hand in hand with merit rating as a guide for supervisors in upgrading and training subordinates.

Briefly, an evaluation program covers the definite classification of jobs in which they are graded according to their relative difficulty and responsibility, and are evaluated in terms of other jobs. Factors considered are skill, effort, responsibility, and working conditions. Old jobs that change in scope or nature are re-rated. A change in a rate range within a particular grade permits deserving employees to receive additional pay. An employee having special capabilities and worth which permit him to undertake duties and responsibilities in addition to his regular work would, therefore, receive an equitable wage in a plant using such a plan.

In the case under discussion, Ed argues that you can't convince the men you're rating the jobs, not them, no matter how much you talk to them or what literature you get out on the subject. That is a negative attitude to take, but it may be due to lack of proper and adequate preparation and education of both foreman and worker in evaluation principles. It is important when discussing job evaluation with employees to make clear what the plan does not do as well as what it does. It does not measure the worth of a worker's abilities, but it does measure what the job requires in skill, effort, responsibility, education and job conditions.

While elements in plans may differ, the following is typical in rating industrial jobs: *skill*, which covers the education and training, experience, initiative, and ingenuity required to do the job satisfactorily; *effort*, which covers the physical, mental, and visual demands required for the job; *responsibility*, which covers responsibility for equipment, material, safety of others, and instructing or directing the work of others; *job conditions*, which covers working conditions and accident hazards of the job.

In order to collect information about the jobs, the first step is to obtain the cooperation of the employees who fill them. They know from their own experience what their jobs require and are in a position to give necessary information quickly. An effective way to gain acceptance for such a program, and to obtain cooperation, is to call employees to-

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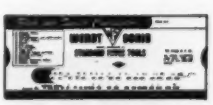

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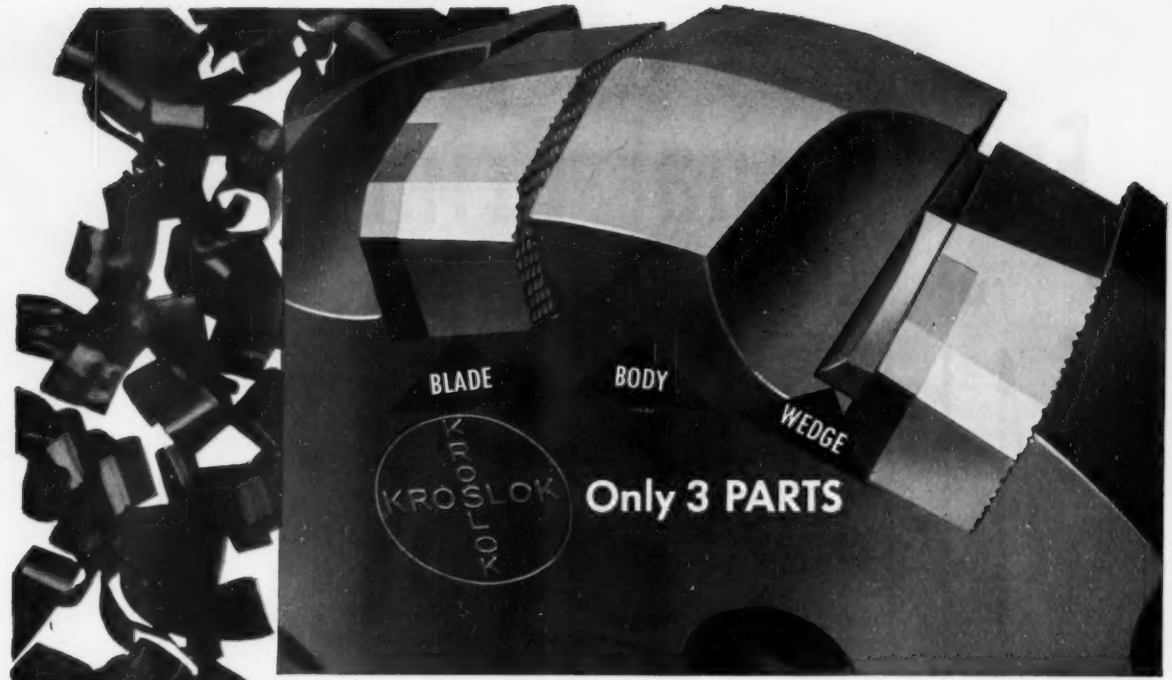
gether and explain just what job evaluation is and answer questions concerning its benefits and general fairness. They should be asked to fill in a job-description form which is checked by the foreman who is familiar with the jobs under his control, and corrected if necessary.

The final evaluation program should be handled by a committee organized from management, supervision, and labor. Recommended members are representatives of the personnel department, factory superintendents and foremen, together with key workers. Inclusion of employee-representatives on the committee is a good policy. When employees are asked to cooperate in the formation of a plan, they understand it when it is completed, and sell it to their associates.

Perhaps one of the greatest advantages of a job evaluation program is that it "blueprints" definite jobs which an ambitious employee can use as a stepping stone to greater opportunity. In other words, the worker who wants to get ahead and better himself economically can set his sights on a job to his liking and bid for it. Employee ambition will be stimulated because recognition of merit and promotion to positions of larger responsibilities will depend on being able to fill a higher evaluated job, the requirements of which are known and fixed.

In the case under discussion, evaluation of Bill Hanson's present job would probably show that it requires a higher grade of work than that of the other men in his group; evaluation would bring his new job into proper relation to the old one to provide a sound basis and justification for a higher rate of pay. In this way the services of a good man would not be lost to the company, his pay would be equal to the work

"I'm a little disappointed with their calendar this year."



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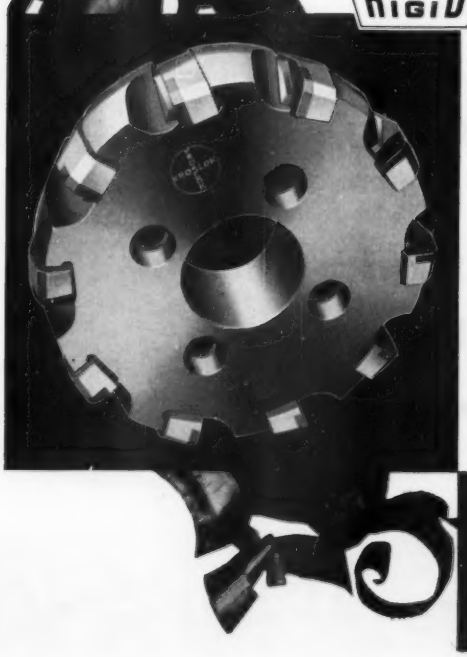

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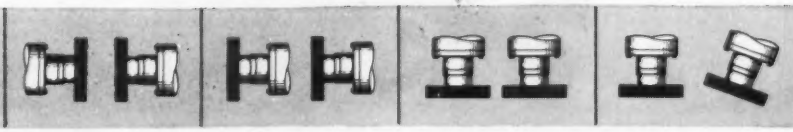

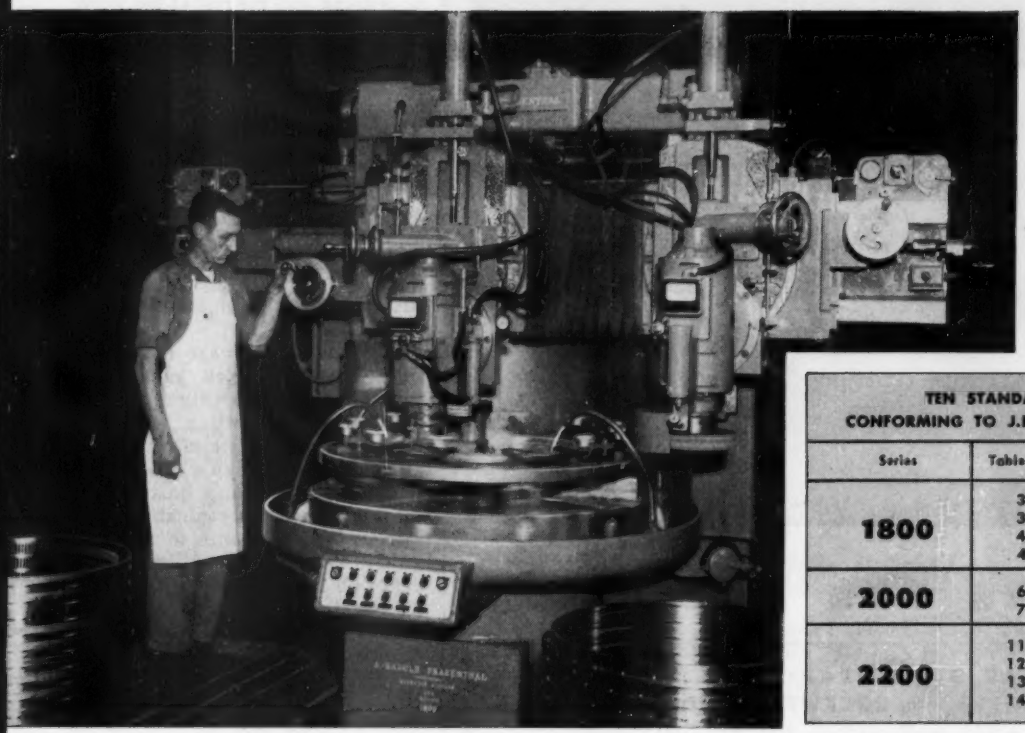

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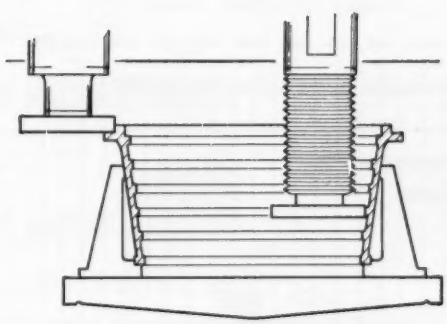
With a single setup, Frauenthal grinders allow you to simultaneously grind related *bores* and *O.D's. round* and *straight,* to uniform accuracy within two hundred millionths! Furthermore you can precision-grind related *faces, flat* and *square,* or *perpendicular,* or at *angles,* to such accuracies.



Here's another typical precision job of simultaneous grinding by a Frauenthal

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Tell us what you aim to do . . . and our engineers will gladly cooperate in helping you find the most efficient grinding procedures. Write for informative bulletin.

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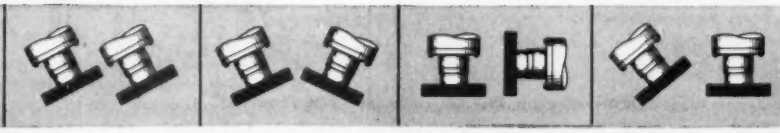

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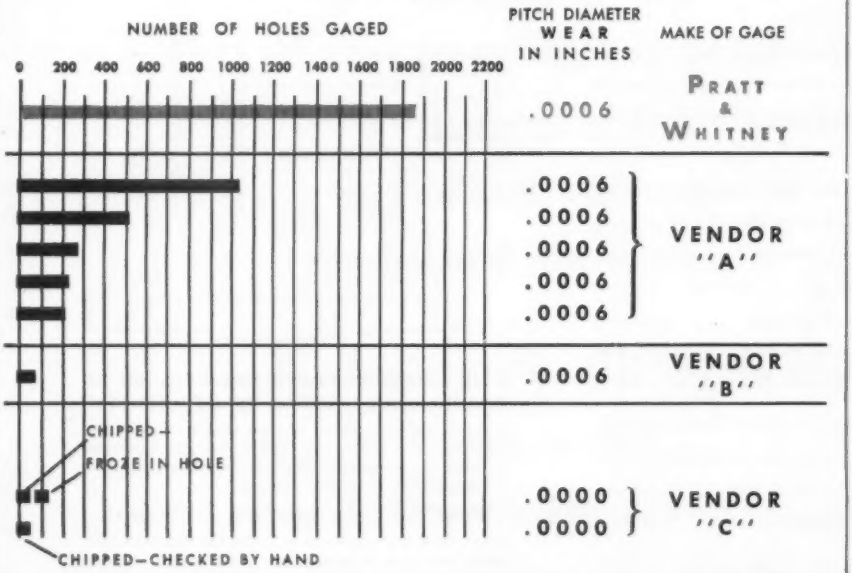

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he is doing, and the rest of the workers would have no difficulty in seeing the fairness of the raise for Hanson. As a matter of fact, job evaluation might effect raises for other men in the group where the analysis indicates inequality exists.

Job evaluation may be a "mare's nest" to some foremen and workers, but without it the plant would be a "hornet's nest." The foreman is skating on thin ice if he gives a raise to one man in his group without proper job evaluation to back up his action.

In many cases, wage rate structures have developed haphazardly through the years, with favoritism and partiality affecting some, and technological changes affecting others. The result is often a hodge-podge with neither sense nor justice. It is the province of job evaluation to restore a logical balance to the wage structure, remove inequities, and arrange all the job assignments in the organization in correct order with respect to their relative values to the employees and the employer.

As an organization expands and changes in personnel are made, it becomes clear that all men do not possess exactly the same combination of abilities. The tasks to be performed by particular occupants of jobs must vary with their own ability, the ability of others in the organization, and the work that must be done according to current business order and general conditions. A good man with a special combination of abilities will create an im-

"Be on your toes, Bolger—Here comes the safety inspector!"

portant job for himself. If the need arises to replace him, it may not be possible to do so with someone who possesses exactly the same qualifications; instead it will be necessary to modify the requirements of several other jobs in order that the work may be adequately performed. A job evaluation system should allow good men to make their own jobs and not cramp talent into inflexible categories and titles.

Harry Kaufman
Philadelphia, Pa.

•

BACKWARD FOREMAN

Must a foreman be able to run all the machines in his department? Can he keep the respect of the men if his knowledge is more along leadership lines than practical experience?

IN MY OPINION, ingenuity and drive are very essential qualities in a machine shop foreman; in fact, the average foreman will usually be found to possess these qualities to a certain degree. But you certainly cannot rule out the know-how that comes from practical experience in the setup and operation of the machine tools that are basic in any shop, so I would say that a foreman who is lacking in this knowledge and experience would be severely handicapped — to say the least. In fact, looking backward over a long period spent in machine shops, I can't remember knowing or working for a foreman who hadn't served an apprenticeship, or at least spent some time in the actual operation of machines.

As I see it, a foreman should know what the machines in his shop are capable of doing before he can assign the jobs that are to be done. If he knows, for instance, that a certain machine cannot be depended upon to work to close tolerances, he will assign jobs to that machine that do not call for extreme accuracy. He may not necessarily have operated that particular machine, but his experience tells him that no amount of ingenuity and drive will coax the machine into working to tenths. So he assigns the close tolerance jobs to a machine that will deliver that kind of accuracy and saves himself some headaches and his company a great deal of money. This particular type of know-how cannot be learned from books, nor picked up overnight by even the most ingenious person; it comes as the fruit of years of experience.

Not discounting the fact that this fellow Gibson may be a very ingenious character when it comes to bench work and sheet metal work, he is go-

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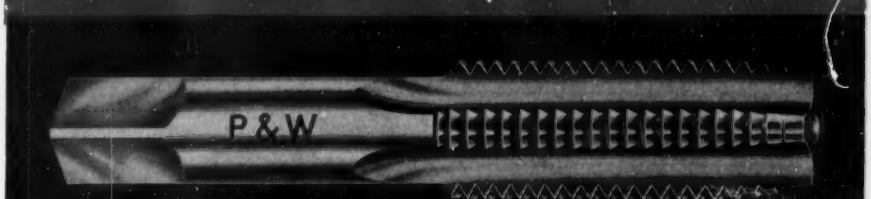
Always Accurate



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Shanks are precision ground, on centers, as the first step in insuring concentricity between the chuck and the threads on the tap itself.

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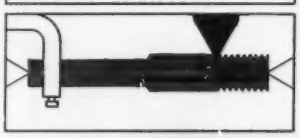
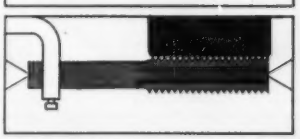


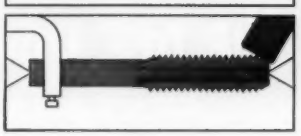
Threads are precision ground, on centers, to insure a uniformly perfect thread form, the basis of clean, accurate threads in the finished work.

O.D.'S GROUND on CENTERS



Outside diameters are precision ground, on centers, another step in maintaining necessary concentricity between shank, pitch diameter and crests of the thread.

CHAMFERS GROUND on CENTERS



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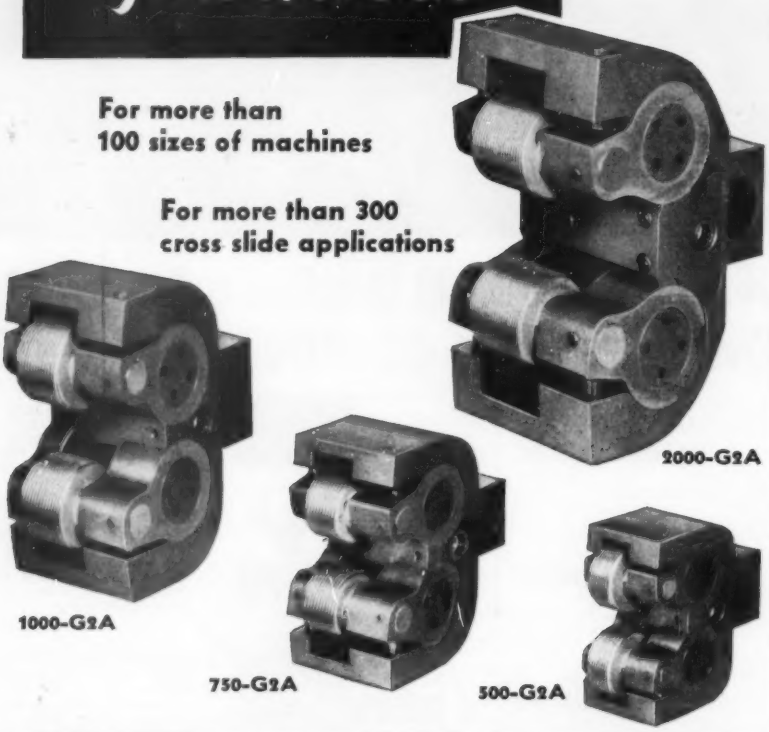

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ing to be a very bewildered individual when one of his toolmakers asks for advice on, say, a difficult setup on the jig borer. If the foreman can't come up with a logical attempt at solving the problems, he is certainly not going to gain much prestige with the men, no matter what the Big Boss thinks of him.

As to the question of where the dividing line begins between a special leader and an ordinary foreman, I would say that the special leader should have specialized in some process that the ordinary foreman could not be expected to become expert in because of the range of his other duties. In other words, the foreman in the average machine shop bears the same relationship to his work as the general practitioner does in the field of medicine. He can diagnose most of the ills that beset the machine shop, just as the GP can diagnose and treat the human body, but he doesn't pretend to have specialized knowledge in one particular field.

With that thought in mind, I would say that Gibson is being miscast in the role of foreman if he is lacking in the fundamental knowledge of the machinist trade. If he has demonstrated marked ability as a sheet metal worker, why not use this specialized knowledge to the utmost. Or, if the Big Boy feels that Gibson has the ingenuity and drive to make a good executive, why not make him an assistant to the president?

From the standpoint of shop morale, there is no doubt in my mind as to the effect of Gibson's appointment as foreman of experimental machining. There is going to be an underlying feeling of resentment among the oldtimers in the shop, particularly those who feel that by training and experience they are bet-

"Fine, safe driver, that lad."

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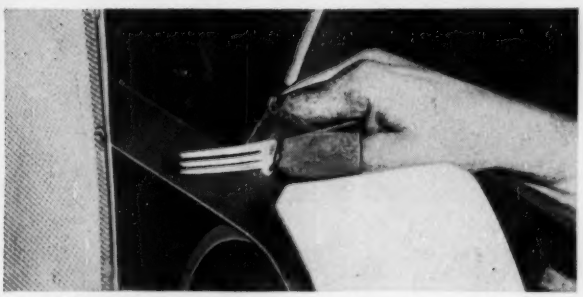
To cut unit costs of trimming and polishing sterling silver forks and spoons. Towle Silversmiths, of Newburyport, Mass., wanted a modern, low-cost method which could equal the fine results of patient, old-time craftsmanship.



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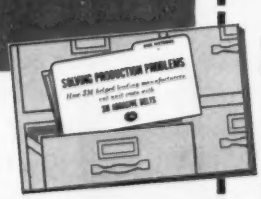

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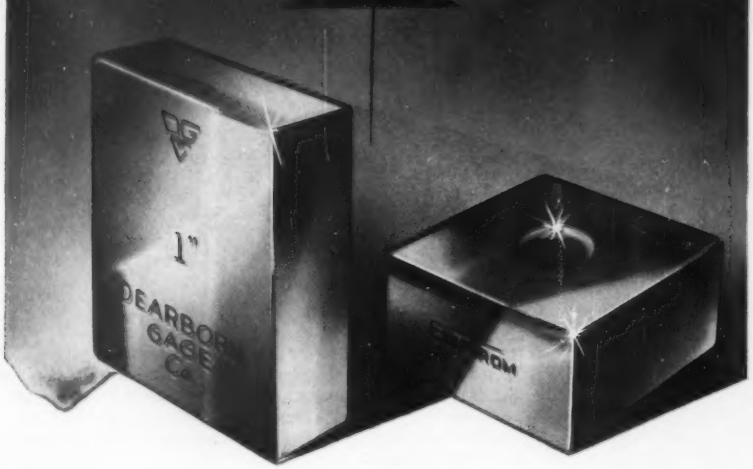

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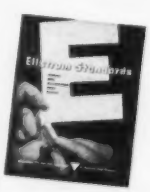

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ter equipped to handle the job than a man "who doesn't know a miller from a lathe." Also, don't forget that while Gibson is picking up his knowledge of machine shop practice, these oldtimers will have to carry him. He will need all his ingenuity and drive, as well as a great deal of personal charm if he expects to survive and really gain the respect and confidence of the men. An experienced foreman knows how diffcult it is to break in new personnel, even equipped with a thorough knowledge of the machines and processes.

When you start from back of scratch like our hero, Gibson, you travel a rugged road. No, I wouldn't want to be in Gibson's shoes. Like Al, I believe this is one of those appointments that shouldn't have been made.

Robert S Alexander
Greenville, RI

WHEN IT COMES TO A FOREMAN for a machine shop, I think Al is right; the man in charge should be well acquainted with the machines of the trade. On the other hand, if it's a foreman for a manufacturing department, it's a horse of a different color.

I remember two cases in point. One was a job of a specialized department where the foreman died and the company put in a man who knew practically nothing about running the machines, as he was the time clerk under the old foreman. This man took over and did an excellent job with the help of an assistant supplied by the machine division. The other assignment was a draftsman who took over a grinding department and made good.

If a man has ability to get along, with help, and can get out production, he will probably learn to master the technique of the operation of the various machines and appliances in short order.

Management in general picks its foremen from men with mechanical

"That's the dirtiest trick I've ever seen played —hiding a man's pants at quitting time!"

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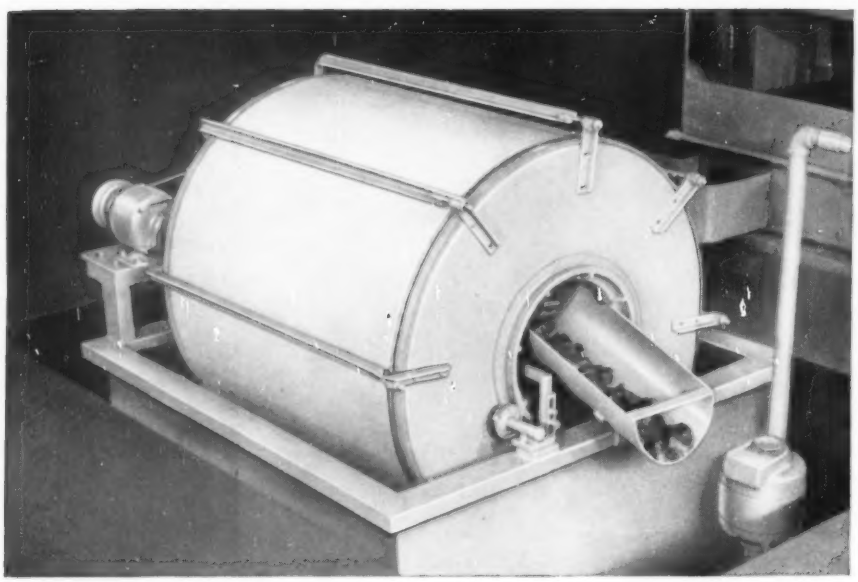

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training, if they also have the qualifications of leadership. In some cases men are available with outstanding qualifications of leadership, and little or no practical mechanical experience. Many of the latter are chosen and make excellent foremen. The trend is towards college men who have learned the fundamentals of management; if they also have personality, they are good timber for supervisory jobs.

Wm C Betz
New Britain, Conn

OF ALL THE ASININE THINGS I have ever heard of—to put a man in charge of a department who wasn't able to handle the machines therein! Under such a setup you can depend upon it that if the men become aware of the situation there is going to be some difficulty. How is a man going to direct a job if he is ignorant of the basic means of doing the work?

In any shop, where efficiency is the keynote, the executive must be aware at all times of the many details of production. Not to be acquainted with every phase of working procedure is putting the foreman in a bad light, not only to himself but to the men under him. Knowledge of a foreman's weakness spreads like the devil and in time the men will deliberately find any excuse to embarrass him. Workmen are as a general rule an intelligent group, especially in such a department as complex as experimental machining, and would not be happy were they confronted with a man, from whom they were expected to take orders, unfitted to properly direct them.

How much better it is to know that the man you are working for is not bluffing along. There is a certain stability to one's own comfort to know that the man higher up is on hand at all times to relieve you of difficult problems. While it isn't necessary for a foreman to be able to operate any of the machines in his department, it certainly would be to his advantage to be able to do so in the event that an emergency should arise in which he would be called upon to jump in and help out. I can recall a works manager who took off his coat, rolled up his sleeves, and ran a planer all night just to encourage the men to do their utmost in getting a rush order out of the shop. That might appear to be an act of bravado but it so happened that the working force was considerably reduced by an epidemic of flu and old Ted just couldn't resist putting his shoulder to the wheel.

Gibson is not the first man to take

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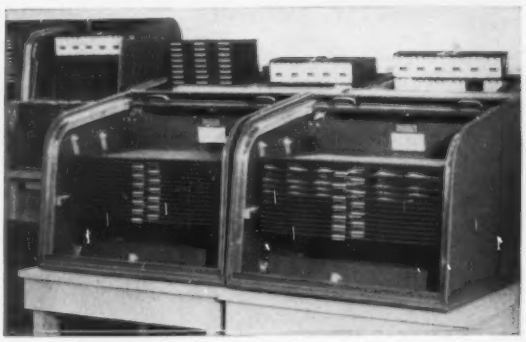

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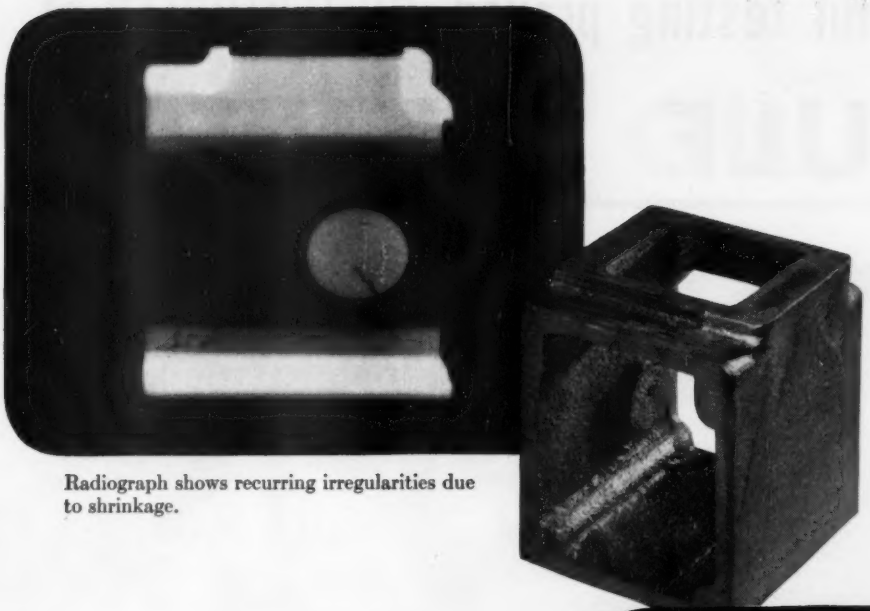
over a shop without a working knowledge of his equipment. I've seen many a man hired to oversee a shop who wasn't prepared to operate the machinery he would be called upon to direct, but in every case he was at a gross disadvantage because of that lack. Although the foreman may never be called upon to do any machine operating, it is a certainty that he is going to be at a loss to direct his men properly if he isn't at least acquainted with the workings of his machines. In the event that one of his men strikes a snag and doesn't know how to proceed with his work, how is Gibson going to advise him? Were the men apprised of Gibson's lack, you can bank on it that they will make it a point to be stuck on many occasions so as to embarrass their half-prepared foreman. They'll do it every time, not only to get a kick out of the man's embarrassment but to enjoy the chance of killing a good slice of valuable time at his expense.

No, I wouldn't take a chance on a man who wasn't properly equipped in skill as well as knowledge. Skill without knowledge is common among workers but knowledge without skill among executives is very uncommon because of its disastrous results to effective supervision.

Robert Roundbottom
Laguna Beach, Calif

IT IS DEFINITELY NOT NECESSARY for a foreman to be able to run every machine in his department. I have worked in shops where the foreman could run any machine in his shop, but I have never worked in any shop where the foreman could run every machine better than every one of his men could. There is always a better lathe, shaper, or milling machine operator sticking around somewhere

"Looks like a swell idea, George, What's it for?"



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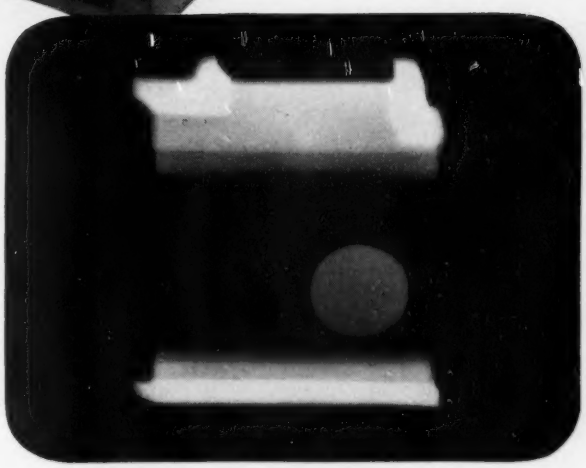
RADIOGRAPHY

puts the finger on a profit thief



A change in gating produced sound castings.

Shrink was a problem in casting this instrument housing of 355 aluminum. It looked like the yield would run low.

But radiographs of pilot runs put the finger on the cause—revealed a pattern of recurring irregularities. This suggested a change in gating which, when adopted, quickly corrected the difficulty.

Cases like this show why more and more foundries make radiography a routine practice. It proves their work sound—helps build a reputation for consistently good castings.

Wouldn't you like to know how Radiography can work for you? Get in touch with your x-ray dealer. Or, write us for a free copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography...
another important function of photography

Kodak

careful testing proved SUPERIORITY of

GULF LASUPAR

Mr. Raymond St. John, inspector, and a Gulf Sales Engineer discuss results with Gulf Lasupar Cutting Oil in machining bevel gears.

A close-up view of bevel gear cutting, showing Gulf Lasupar Cutting Oil in action.

CUTTING OIL

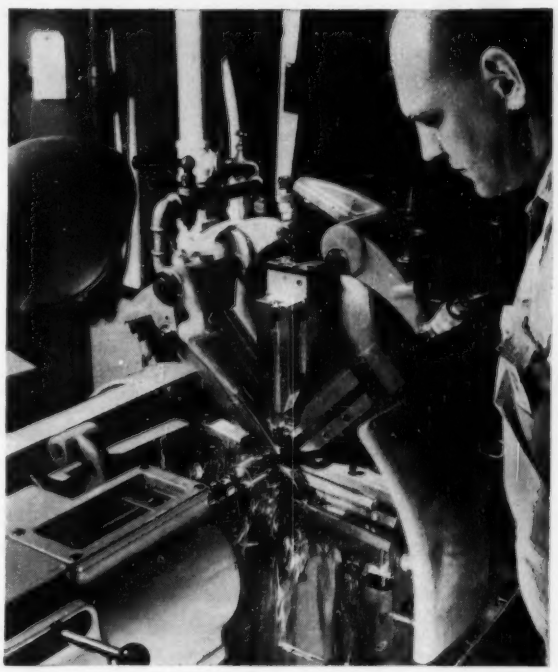
for every cutting operation at Belock Instrument Company, Long Island, New York

Belock wanted a cutting oil that would produce precision instrument parts to extremely close tolerances, and give an excellent surface finish with as few tool changes as possible.

After careful tests, using many kinds of cutting fluids, they found that Gulf Lasupar Cutting Oil gives them better performance over their entire range of machining operations on the many types of steel they process.

In Gulf Lasupar Cutting Oil you get three degrees of sulphur activity, each designed to provide better protection for the tool and to insure a better finish under a given set of machining conditions—(1) extremely active free sulphur held in a stable solution, (2) sulphur combined with mineral oil by a special Gulf process, and (3) sulphur combined with fatty oil.

A Gulf Sales Engineer will be glad to demonstrate the advantages of Gulf Lasupar Cutting Oil in your plant. You will find him always "on call" at your nearest Gulf office.



A Bechler Swiss Automatic Screw Machine Cutting A.I.S.I. 416 Stainless Steel. These Gear Blanks are held to tolerances of .0003 of an inch.

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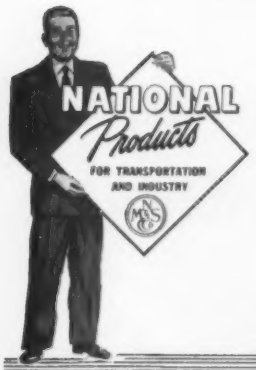
Castings by National

selected for Quality and Dependability



Products bearing these familiar trademarks have all established enviable reputations for quality and dependability. And to guard product reputations, these manufacturers *continue* to specify castings by National —one of the Nation's largest founders.

National's unparalleled experience in producing malleable, heat-treated malleable, and steel castings is at your disposal. Sales offices and engineering facilities are located at all five strategically located plants.

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PLANTS LOCATED IN Sharon, Pa., Cleveland 6, Ohio, Indianapolis 6, Ind., Melrose Park, Ill., and Chicago 50, Ill.

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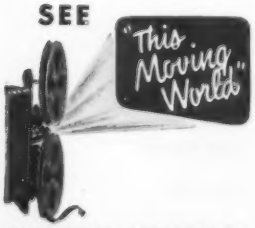


A 16mm Technicolor film. Narrated by Edwin C. Hill, this 27-minute film tells how malleable iron is made . . . tested . . . used . . . how its production economy, ductility, machinability, toughness will give you a better finished product. Available for group showings.

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY
CLEVELAND 6, OHIO Est. 1868

who is several up on the boss.

It is desirable for a foreman to have a working knowledge of all the machines in his department, and certainly he should be familiar with their possibilities. It is a must for the foreman in dealing with the men, to show impartiality, good judgment and tact. If he can gain the confidence of the men by fair dealing, a willingness to fight their battles, an impartiality in handing out assignments, the men will carry him on the things he doesn't have.

I worked in a machine shop where the master mechanic of all the shops was a boiler maker, who told me frankly that an eighth of an inch was a boiler-maker's thousandth, and we got along fine. This man had good judgment, executive ability, and a full stock of native ingenuity. He certainly had limitations when it came to dealing with Corliss engines in the power house and triple stage compressors, but he was well liked, respected, and accepted at face value.

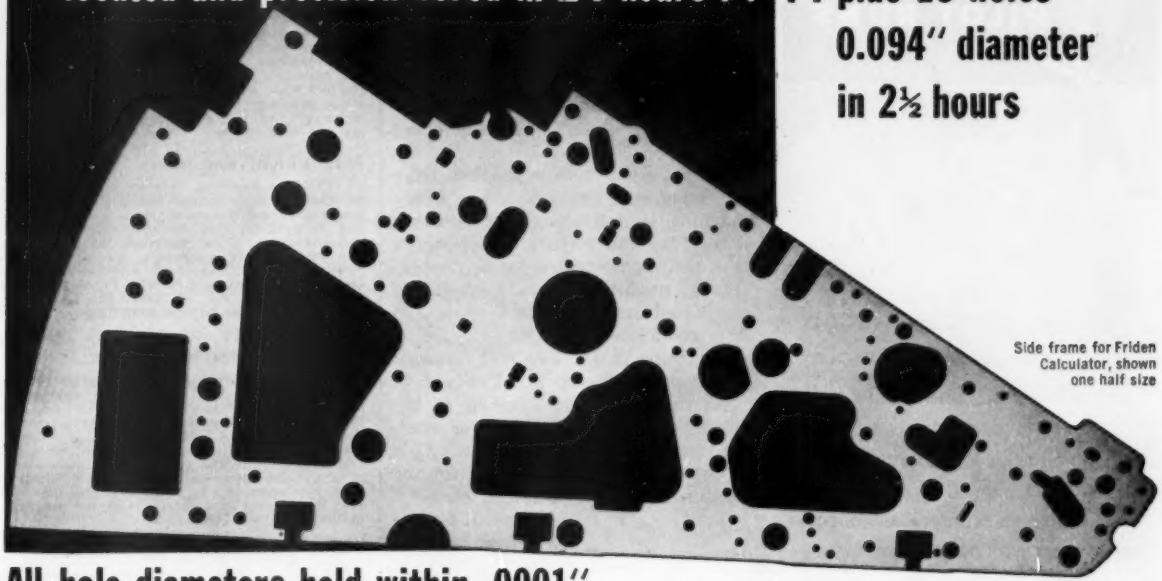
On the other hand, I would not consider appointing a time keeper to the job of foreman in a tool and die shop because he would very probably get into trouble. A new foreman makes a point of finding out what the capabilities of his men are, and similarly, the men make a point of finding out what the capabilities of the boss are. As a machinist, I never worked in a shop where I didn't have the boss's number in a very short time. He might have had my number, but I'd wager that I had his first.

Unless a machinist has done a great deal of "booming" in his career, it is impossible for him to meet with and master all the different types of machines that are available today. The average shop doesn't have a slotter, a thread grinder, a centerless

"I must be getting old. I try to concentrate on dames but my mind keeps wandering off to what I'm doing."

At Friden Calculating Machine Co.

83 holes of varying diameter in pierce die located and precision bored in 24 hours . . . plus 15 holes 0.094" diameter in 2½ hours



Side frame for Friden Calculator, shown one half size

All hole diameters held within .0001"
All distances between holes held within .00015"
on LINDNER OPTICAL JIG BORER

Such jig boring speed and accuracy speaks for itself—and explains why Friden now uses three Lindners, and why a growing number of important toolrooms who measure precision in extremely close limits, have also installed one or more of these machines—among them companies like these: RAYTHEON CROSLEY (2) CURTISS-WRIGHT (4) LOCKHEED GENERAL ELECTRIC CONTROL INSTRUMENT TEXTILE MACHINE WORKS BORG-WARNER BENDIX (2)

Here are other good reasons—

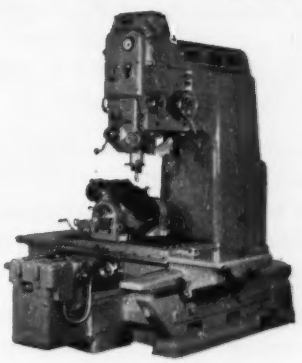
Direct reading optical measuring system speeds hole location with table settings *guaranteed accurate to .00015"*. Measuring system permanently free of mechanical wear... only a light beam touches it. Hole location may be approached from either side with simple, conveniently grouped controls.

Rugged construction for heavy roughing operations without affecting accuracy on fine precision work. Sturdy, compact spindle head runs on precision roller bearings. Table takes loads to 2200 lbs. Spindle motor 3½ h.p.

Deep throat and roller bearing table movement. Clearance between boring spindle and table is optionally from 29½" to 43½". Longitudinal and transverse tables move on specially matched precision roller bearings—reduce friction and permit extremely fine table adjustments. Rapid traverse (up to 40" per min.) is automatic. Table sizes are 44" x 24" (LB 15); 32" x 16" (LB 14).

Infinitely variable speeds and feeds. Spindle speeds 50-1900 rpm; spindle feeds .0012" to .0064"; power up-feed of spindle for fine finishing bored holes.

You would do well to inquire about Lindner Jig Borers from us or from a Lindner user. May we send you complete details?



New Preselective "Autopositioner"

This exclusive Lindner development enables operator to preselect table position for the *next hole* while one boring operation is in progress, eliminating non-productive time between holes. As one hole is completed, table moves in rapid traverse to preselected position. Only a few seconds for fine adjustment are required before boring. Optical projection system permits exact centering with minimum visual fatigue and human error factor greatly reduced. Autopositioner is available only in new Lindner Model LB 15 illustrated above.

Engineered servicing and stock parts from Orban Service Centers in Cleveland, Detroit and Newark, N. J.

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SEND FOR INFORMATIVE LITERATURE

STAMPINGS DIVISION

LAMINATED SHIM COMPANY, INC.

3101 Union Street, Glenbrook, Conn.

thread grinder or a Swiss jig borer. I have never operated a centerless thread grinder, but I'll guarantee to take it in my stride, and many other mechanics will do it even faster.

So, would I consider myself backward if I were to take over a shop in which there were several machines I hadn't personally operated before? Immodestly, I answer, "Not me, Mister. Trot 'em out and time me. I'll run them in a very short time."

And again a man might not have the experience required to run every machine in the shop, but, without doubt, he has virtues and positive talents that make up for any negative talents he possesses. A good man can handle any kind of a shop, and do a good job at it.

Summing it up: I've met foremen who were disliked, but I've yet to meet one who was laughed at because he had personally never operated certain machines. After all, it is not the foreman's job to run the machines anyway—so who cares?

James K Matter
Detroit, Mich

CERTAINLY WE EXPECT our foremen to be able to operate the equipment they supervise. It is only natural that a foreman is able to do this because the selection of the man to fill the job is from the ranks. True, we pick a man who has leadership, but we are sure that the best foreman is the best worker. Haven't you heard the remarks passed by hundreds of superintendents, plant managers, and even presidents of companies? Is it right to assume so much when everything a company does depends upon the proper selection of foremen? Should not more thought and energy go into the filling of this most vital position in the company? The foremen are the bulwark of the organization. They can make a successful company,—one which either ad-

"He says it needs a good strong dose of caster oil."

Books Serve as Tools in Defense Production

Defense production needs have put the spotlight on today's rapid technical developments —in machines, materials, processes, and management. New demands for know-how and skill face your personnel, from top engineering design down through the many levels of supervisory and mechanical shop work. Make sure you get the maximum efficiency and production from your whole staff—give them the advantages of the technical training and upgrading afforded by McGraw-Hill books.

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An outstanding reference bringing you authoritative data on the design, fabrication, maintenance, and economical use of industrial tools and machinery. It covers everything from product design and cost estimating . . . through the economical selection of machines, processes and tools . . . to the analysis and improvement of setups and operations. **By American Society of Tool Engineers, F. W. Wilson, Editor-in-Chief. 2150 pages, over 2000 charts, table and diagrams. $15.00**

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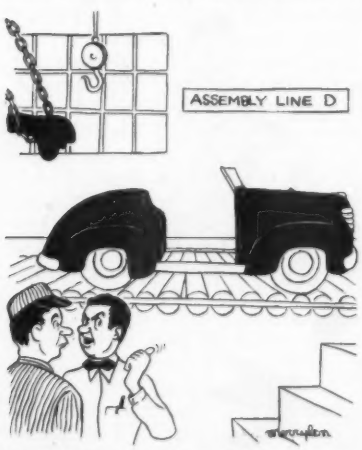
vances with rapid strides or is everlastingly upset by internal strife. Petty as it may seem, nevertheless strife causes slowdowns and the loss of production hours cause loss of profit.

It is a sad state of affairs that we have drifted into. No, not drifted, because for years upon years this same trend has been followed, the same pattern, the same excuses, and the same caliber of foreman exists. They can run all the machines, but they cannot manage well.

Please don't think that every company and every foreman falls into this pattern. It is well known that many companies have awakened to the fatalism of hit or miss selection of personnel and are now properly studying replacement of foremen. But what we are saying is that many more companies are on the verge of disaster because the foreman can only run machines and cannot properly attack or solve the problems at hand. So when a selection of a foreman who can't run all the machines and doesn't know all of the quirks of setting up the job is selected, then the oldtimers sadly shake their heads and mutter "Just a backward foreman." Perhaps they have a guilty twinge and wish that they had been selected. Sometimes having such mental thoughts can cause the tongue to wag.

What constitutes a good foreman, you might well inquire. You would receive many different answers. Each and every answer would undoubtedly contain at least some truth. Our concepts of things is as varied as are individuals. Perhaps some of the more important points of being a good foreman are as follows:

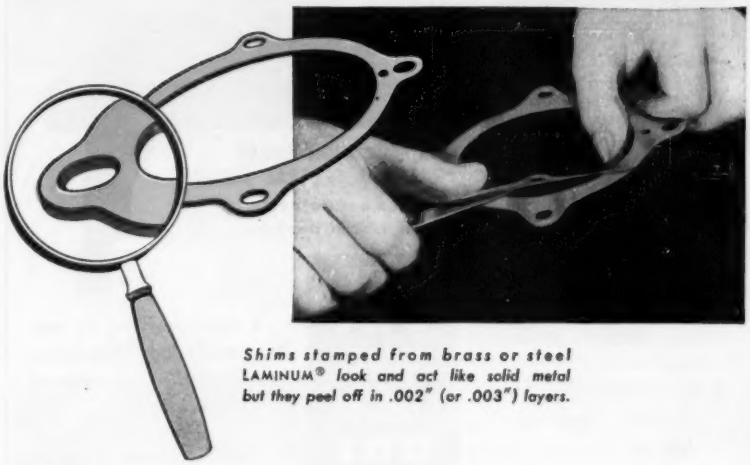
1. Being able to direct people under your guidance properly. This does not mean doing the job for them. It means having the ability to



"Just because Joe is home sick is no reason to leave his section undone!"

LAMINATED SHIMS

SIMPLY PEEL FOR ADJUSTMENT



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talk about the job. You are not expected to be an expert on running the machine. You are there to see that the flow of work is constant, not to do the work yourself.

2. Know how to budget—time, money, and manpower.

3. Know company policy and be able to talk about it to your employees.

4. Be willing to learn. Find out about what others are doing. Profit by the mistakes of others as well as your own.

5. Train someone to do your job efficiently. This sets you up for further advancement.

Many, many more could be added to the list but why not make up your own list and then try to live by it. Actually there is no line of demarcation between good foremen and leaders. Special leaders are actually good foremen well trained.

You don't expect your superintendent to be able to operate every machine and do every job in the plant. You don't expect your president to know how to set up a boring mill, an automatic, or other machinery; then why is it necessary to have a foreman do it? True, it has always been done that way, but why not advance with the times? Pick men who are capable of being good executives and watch them and the company grow. They know how to get the job done—not just how to do it.

Charles D Townsend
West Hartford, Conn

THE FOREMAN of an oldtime small machine shop was always supposed to be able to run any machine there

"I borrowed your stool while you were asleep—"

and do so better than the machinist himself. The standard machine shop in those days was a large lathe, a small lathe, a large drilling machine, a sensitive drill, a milling machine, a shaper, a planer, coarse and fine emery wheels, and a metal-cutting saw. The foreman generally grew up in the shop and had run each of the machines many times. That was years ago. Today's modern machine shop is something different; it is equipped with a great variety of complicated tools each of which requires an expert for its operation if it is to pay for itself and show a profit during its estimated accurate production life.

To expect the foreman of a modern machine shop to step out of his office and get production out of any tool in the shop is as unreasonable as it would be to expect the head doctor in a surgical hospital to perform any operation that may be required; be it a brain tumor, heart valve, appendicitis, removal of gall stones, or any other highly specialized operation.

To meet the requirements set up by Al, the foreman of a large machine shop would have to spend practically all his time studying and working the many complicated operations of every new machine installed in the shop. All planning to meet schedules, to use up stock that is threatening to become obsolete, to be sure that no unexpected shortages in materials occur, to know who to switch in the event some workman is taken sick or unexpectedly absent, and which machine to use on every order so as to keep the overhead at a minimum, would of necessity have to be curtailed with the inevitable result that the overall efficiency of the shop would fall, resulting in disciplinary action against the foreman. On the other hand, the foreman must know the capacity and speed of accurate output of every machine under his control, also its overhead in order to proportion the work so that each machine not only keeps ahead of its depreciation but earns a profit. If he does not do this, it will not be long before he and his men will be hunting for jobs.

A foreman is hired to run his department so it will earn a profit on the big investment for buildings, plant and organization. He is a manager, on a smaller scale it is true, just like the general manager of the company. It is not so important that he be able to step up to a precision grinder and finish a spindle to an accurate running fit as it is that he be able to select and quickly train a workman to do the same job.

Al should remember that when an architect is hired to design and over-

Hanging on to the "hot" ones often calls for maximum speed and accuracy. Therefore, structural steel fabricators must know they can rely on their men and machines. While men can vary, BEATTY machines are designed to always give you built-in speed and accuracy — plus the widest safety margin possible. If any of the machines shown isn't the answer to your particular production problem, BEATTY engineers can design and build to suit your exact needs.

A. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

C. BEATTY Spacing Table handles web and flange punching without roll adjustment.

D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

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Scientifically controlled bonds perfected to do the best cutting job consistently and economically.

Wheels shown here are the most popular for use in efficient grinding rooms . . . available immediately in all diamond grit sizes and in metal or resinoid bond.

a size and style for every need

Type D1T: Used for chip breaker grinding, surface grinding, large cutter grinding, cylindrical grinding. In sizes from 2" to 14" in diameter.

Type D12W: For tool and cutter grinding, reamers, form tool grinding. Sizes 3 to 6 inches.

Type D6WHC: Off-hand grinding, single point tools. Rough grinding inserted blades. In sizes 3½, 6, 10, 14-inch.

Type D11T: Universally used for tool and cutter grinding. In sizes 3, 3¼, and 5-inch diameters.

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Type DWS: Internal grinding, and contour grinding in carbide dies.

Write for catalog showing complete line of sizes and prices

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MADE IN AMERICA FOR AMERICAN INDUSTRY

see the construction of a large building he may accomplish a most successful edifice, and yet he may not be able to frame and hang a door or glaze a large window properly, nor is he expected to have that skill. The distributed load on the foundations and the deflection of various beams are far more important factors, and he should be an expert on them.

The foreman of today is not hired because "he can lick any man in the gang," but because when the auditors present the figures for his department to the general manager they show a satisfactory profit on the money and time invested in the enterprise.

George P Pearce
Albuquerque, NM

•

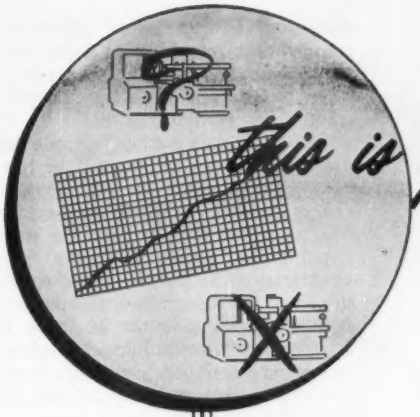
MEDDLIN' MANAGERS

What's the best way to handle the executive who delights in puttering around the shop, particularly during a heavy-schedule run? Is patient attention the answer or will tactful hints do the trick?

WHEN I THINK of meddling managers I cannot forget two of my former bosses. As a shop foreman I had a pretty good opportunity to analyze their innate peculiarities and found them quite unique as a class. Of the two, I would prefer the one who showed up in the shop once in a while to mingle with the men while he pursued his sometimes-annoying tactics tinkering around with some pet gadget, obviously conceived during the wakeful hours of an evening.

The individual of the other extreme was an encased human who considered his person untouchable and couldn't be seen day in or day out, unless it was coming to or leaving the plant. This stinker I'm going to call J D Snooty, for want of a more fitting name. He was one of those works managers who confined himself within the four walls of his

"No wonder we're lost. We've been following a blueprint you brought home from the shop."



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**see the 1953 ASTE Obsolescence Report.*

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The American Society of Tool Engineers is assembling in Philadelphia's Convention Center on April 26 to 30 inclusive the latest in production equipment and processes available from over 450 manufacturers. The exhibits will be open to you and your key men during these five days, from 9:00 A.M. to 5:00 P.M. Included will be inspection and automation devices, machine tools, accessories, cutting tools, and allied equipment.

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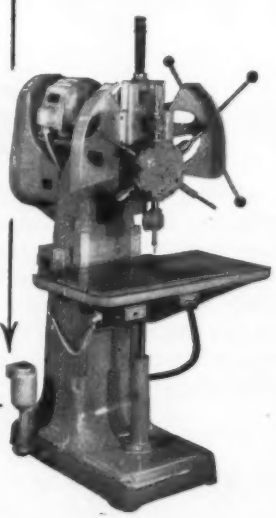

Illustrated is a Burgmaster Drill equipped with a Gusher Coolant Pump. Photo, courtesy Burg Tool Co.

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1818 Reading Road, Cincinnati, Ohio

elaborately fitted office. After he stepped from his Cadillac those near him would bend over backwards to greet him and soon he was closeted within the confines of his holy of holies. J D kept his office in apple-pie order, and when he desired to consult with someone he sent a messenger out to the shop to request his presence. The men around the shop hated his guts and referred to him as Almighty Snoot. He never spoke to any of his men unless about some detail pertaining to the business. If any labor difficulties happened along he would direct his campaign from the seat of his trousers behind his highly-polished mahogany desk.

In contrast to old man Snoot I recall the works manager of another outfit who endeared himself to all of us. "Breeze," as he was dubbed by the boys, was a man of sixty or more years, and he spent pretty near as much time in the shop as he did in the front office. Breeze had no formal shop introduction, such as an apprenticeship, but the old rascal had a hell of a good head on him. He believed in a factor of safety well above necessity. If his only draftsman were to design something and the prints arrived at the shop before he had a chance of glancing at them, he would call the draftsman out to the shop and insist upon replacing a half-inch bolt with a five-eighth. "The half-inch one might break, but I'm damned sure that the other one won't."

He liked to come out to the shop and, without inquiring of any one, he would hurriedly put on his shop coat and proceed to do a job in the little Regal or perchance the American shaper which he loved as much as a three-year-old kid would a toy train. If it so happened that the lathe, shaper, or miller was set up with a job, he'd tell the operator to get the hell out and get on another

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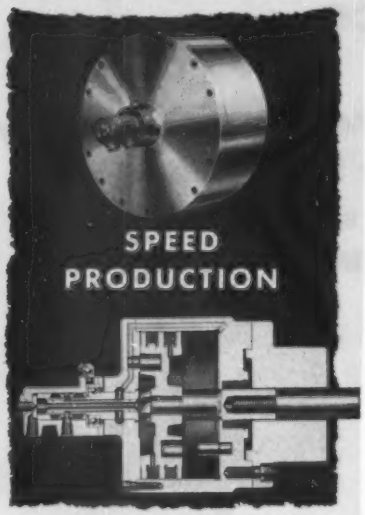

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machine. The boys liked old Breeze and were inured to his gruff commands. I, as the shop foreman, could have bristled behind the neck and raised an objection to such procedure but "What the hell," I said to myself, "it's his money, so why squawk—it's no skin off my annex."

Breeze would go up to one of my men and borrow his tools, help himself to a bit he needed, and go about his work regardless of who was waiting for him in the front office. The man was sublimely happy, and although it was contrary to manufacturing efficiency, I did not have the heart to object to his actions. I can imagine what he would have said to me if I had! His eyesight wasn't a 20/20 by any means, and the way he would squint when he set his caliper to a scale, or take a reading from a mike, was a sight to behold. Often he would get a job pretty well along, and all of a sudden the damn thing would fly out of the machine to his utter amazement. Then he would meekly go to one of the men and tell him what he wanted made. I was only the foreman of the shop.

I have heard about another chap who could very well fit in between the two extremes. For convenience, let's call him Frustratus, perchance a hand-me-down from an ancient Roman. Frustratus was as frigid as J D Snooty, manager of the Iceberg Manufacturing Co, and as productive-wrecking as Breezy. Frustratus would consult the shop foreman whenever he wanted to do anything, and griped considerably about any inconvenience he would encounter. Frustratus had served his time with the Hammerless Bung Co, and could turn out a pretty good piece of work, if he could spare the time and stay on it. He would start something and call the foreman over to explain to him just what he wanted and then leave the boss scratching his head in

"It has been called to my attention that you have a neat little side line of loading dice!"

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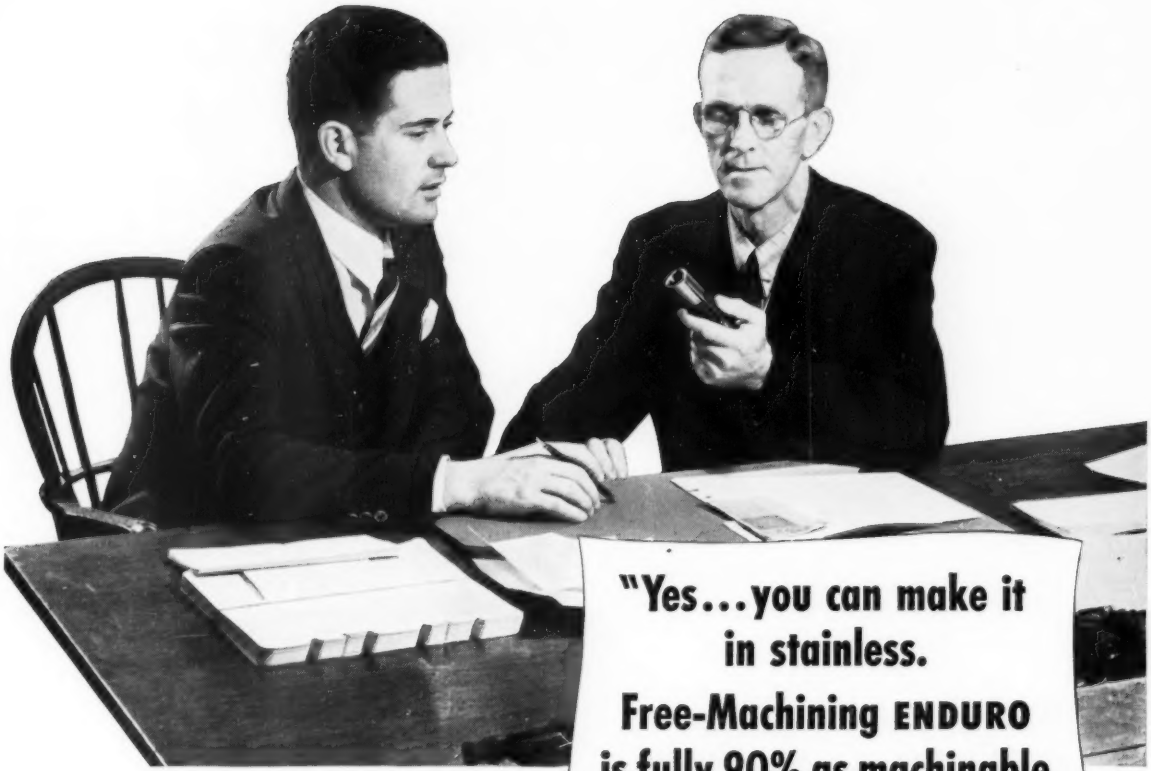

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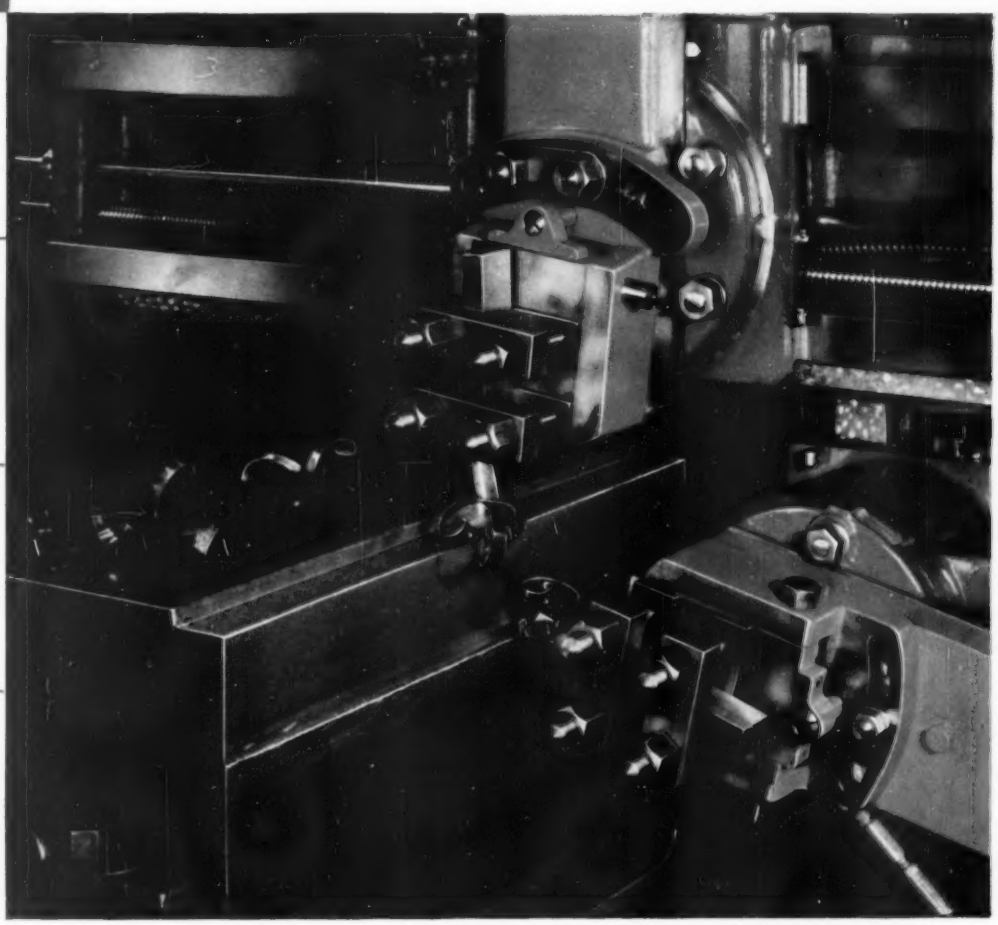

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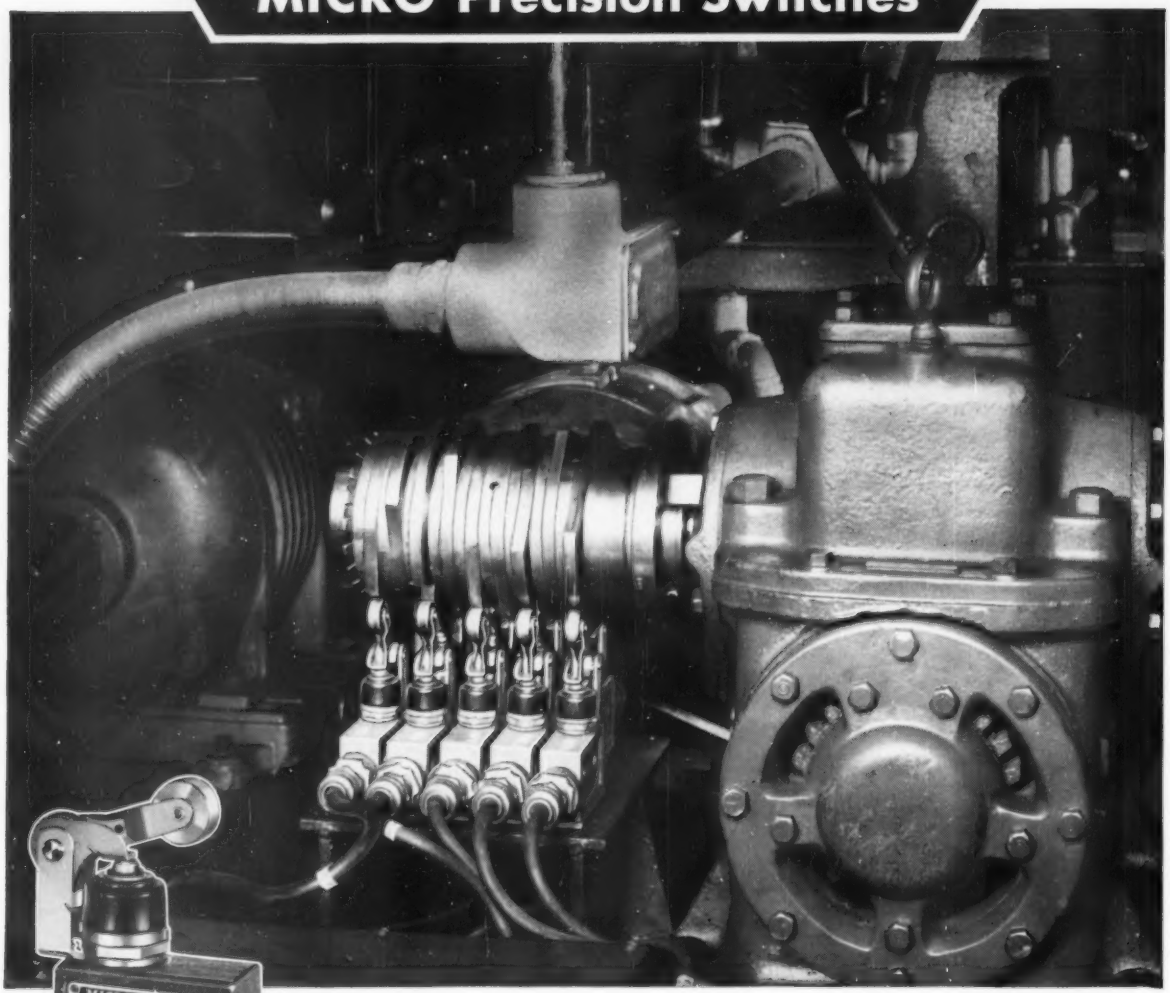

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desperation. No matter how inconvenient it was to pull a man off another job, it had to be done—Frustratus was always in a hell of a hurry to get the job out. No matter how delicate the tool, Frustratus would borrow it and put it back in the fellow's toolbox without saying thank you, go to hell, or whatnot. He wanted it known that he was the high cock of the walk around the shop and bowed to no one. In short, he was a pain in the jet to everyone around the shop, including the foreman, who undoubtedly was scared of his own shadow or he would have taken Frustratus by the collar and seat of his trousers and thrown him out on his ear.

So there you are, Al; you think you got problems! We'll always have shop managers who fail to realize that their meddling tactics severely hinder the proper flow of production. You'll find there will always be interrupting jackasses piddling around when they should stay away from the shop and let the foreman get out the work. No doubt you'll find, if you live right, that St Peter himself will be piddling around beyond the pearly gates and interfering with the efforts of the few foremen so honored by being admitted. Getting back to earth again, let me say that I would rather have my old Breezy wrecking the shop than anyone else that I know!

J Homewood
Tujunga, Calif

AS A LONG-TIME EX-WORKS MANAGER, I would say that Al is worrying himself needlessly, and, frankly, looking for trouble. If Johnson, as plant manager, chooses to take an interest in a shop fixture and fancies himself as a designer or trouble shooter, there really isn't anything Al can do about it. Johnson has a perfect right to take an interest in shop tools and should be able to do so without incurring any resentment from Al. It is always possible that Johnson might have a practical solution for the problem.

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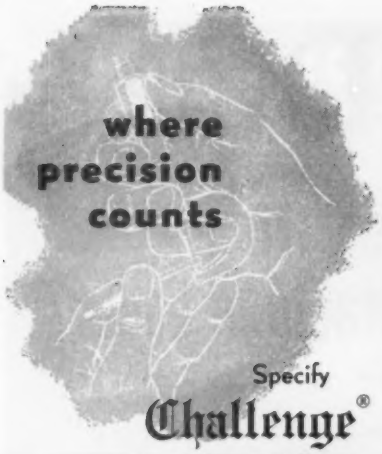

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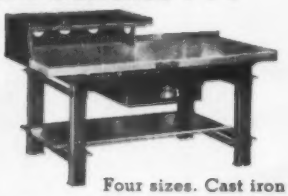

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I've had a very long experience with foremen of Al's type who figure that either they are handling their own divisions perfectly and don't need assistance, or they simply resent anyone outside of their own department coming in and doing things. That resentment is generally more of a personal matter than something which is really justifiable.

Some years ago, during the bank-closing period of the 30's, I took charge of a plant that had been losing money. The drafting room of this plant was overstaffed. The chief engineer was trying to avoid a layoff in his department; he had spent years training his men, and, quite naturally, didn't want to lose any of them. The fact remained that we had 20 more men than we had work for, and the salaries of those 20 men represented a leak of $60,000 a year.

Now this chief engineer was a very fine, high-principled man, but he wasn't carrying the responsibility for the plant's costs, and I was. I had asked him to cut his force, and he had stated that this was impossible. I determined to do it myself.

Every morning I would drop in his office, pick him up, and go over the work on every drafting board with him. On the first day, I found his explanations fair—not good, but fair. The second day his stories started to wear thin. On the third morning I found big holes in his overall picture. On the fourth day when I arrived at his office to start our daily tour, the door of his office was closed, and he was busily closeted with the superintendent of the toolroom. I waited ten minutes, but the conference continued. I was being given a class A run-around. So I started out on my own and made the grand tour myself.

That night, at my home, one of my associates called me. He told me that the chief engineer had called him, talked for an hour, and com-

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plained bitterly because I had, as he claimed, humiliated him by going over the work on the drafting boards without him being present.

I settled that matter the next morning. When the chief engineer reached his office, I was there waiting for him. I immediately locked the door and went to work, and I wasn't giving out any diplomatic lessons in semantics.

"Joe," I said, "I admire you personally as a man of very high character, and as an engineer, for my money, you're tops. If I have ever hurt your feelings personally, I'll apologize to you abjectly in front of anyone you name. But — if you're sulking because I went over the drawing boards without you, you can go jump in the lake, or do anything else you please. That's my job, and I intend to do it. Right now my job is to cut costs. I know we are carrying too many draftsmen for our present load of work, and I intend to follow out orders and cut some off, with the prayer that we can pick them up again in a month or so. I prefer that you pick the men, but if you won't, I will. Now do you want to see the light and play ball—or do we get a new captain?"

Joe saw the light, and we played ball. I could cite many other cases of similar resentment, and I've officiated at the graduating exercises for some of the recalcitrant participants. Naturally, I prefer to, and thoroughly believe in working with the men on the job, but when they refuse to play on my team, somebody has to be benched. I am always going to believe that a dog should wag his own tail.

Just occasionally there happens along a real case of an interfering, meddling hunk of brass who hasn't learned the score. I've learned the correct way to handle that type and you do it in this wise.

Now if I'm a shop foreman, and a star from the higher echelon moves in with a barn-storming idea, I greet

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him with a smile, and a warm handshake.

"Glad you remembered us," I say. "Come right in and take over. What can we do for you?"

"I have an idea—" he says. "But certainly," I answer immediately.

I take my very best, but carefully coached, man away from any job he might be working on. I stop any job. I surround the chap with a dazzling array of our finest talent. We gather around, we applaud enthusiastically, we hover, we concentrate, we are inspired, but—*we offer no suggestions.* We're dumb. Not a hint from us. We're eager beavers, but we're not inventive, and anyway, who are we to speak when the Brass is present?

If the chap should be a real operator, he doesn't need any help. If he isn't, why he'll simply wallow around in a morass of our enthusiastic approval and he'll drown. And this is what we were after in the first place.

That technique is not taught in any university yet, but I call it the passive, negative-acceptance philosophy. Believe me, it works.

James K Matter
Detroit, Mich

IT IS A SHAME THAT everyone cannot get along with everyone else. The world would be such a nice place to live in, and foremen would have no troubles—neither would anyone else. This is not likely in our age, however. Personalities must enter into the picture and we must blend ourselves to current conditions. The ability to be flexible today is one of the biggest assets a person has.

In business with the increased tempo of operation, stress of higher quality at lower costs, the tax structure, union problems, and thousands of little petty things — all of these cause us to work on edge and to clash with each other. Our great problem is not to just increase pro-

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duction at the expense of people, but to both increase productivity and reduce tensions which now exist in our social life. All of this must start in the shop. Each company must do its part and each executive, including the foreman, must do his part in trying to solve our big problem of relaxation without loss of production.

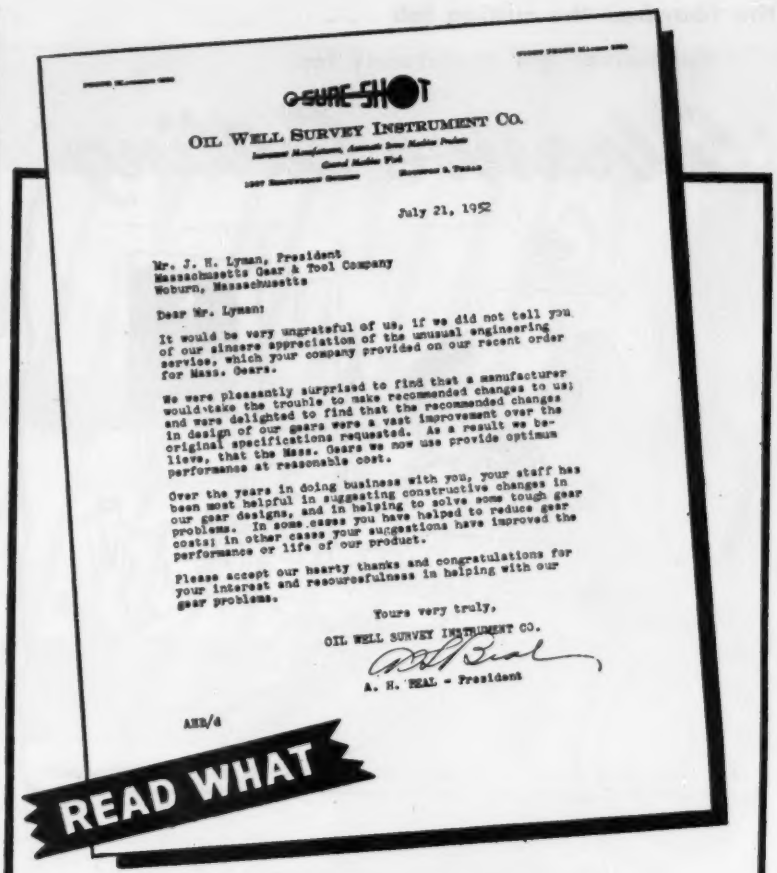
What does all this have to do with our question of whether Johnson should come into production and mess it up? Well, it is the underlying reason, and probably the basic concept of why things happen.

Since each individual has a different makeup and each operates in a different manner, we can expect some friction. We are faced with whether Johnson—a plant manager—should walk into the department and give orders, interrupt production, and change operators' methods. We can only say, first, that he has the right, but we must add, and add quickly, that he is wrong in doing it, providing Al is a capable foreman.

Why should Johnson want to do this? Probably there are many reasons. One which no doubt is basic is the fact that the plant manager is not well qualified for his job. He likes to "engineer" and is not suitable for managing. No reflection upon the man's ability, but rather upon the company for its selection. Johnson is one of the many men who loves to do something which they are prevented from doing until they reach a position of authority—then they step forth. Here, they fail to accomplish their desire and in the end the results are disastrous.

A good plant manager would work through this foreman, not tear him down; and if the foreman failed to function properly, then he would be replaced eventually. The by-pass method only indicates lack of knowledge of who and how to supervise. Perhaps the company is guilty of operating in this manner throughout its plant. Perhaps the works manager and the president also get into the

"You were right, Mel! Go get a maintenance man!"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Massachusetts Gear & Tool Company
Woburn, Massachusetts
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It would be very ungrateful of us, if we did not tell you of our sincere appreciation of the unusual engineering service, which your company provided on our recent order for Mass. Gears.
We were pleasantly surprised to find that a manufacturer would take the trouble to make recommended changes to us; and were delighted to find that the recommended changes in design of our gears were a vast improvement over the original specifications requested. As a result we believe, that the Mass. Gears we now use provide optimum performance at reasonable cost.
Over the years in doing business with you, your staff has been most helpful in suggesting constructive changes in our gear designs, and in helping to solve some tough gear problems. In some cases you have helped to reduce gear costs; in other cases your suggestions have improved the performance or life of our product.
Please accept our hearty thanks and congratulations for your interest and resourcefulness in helping with our gear problems.
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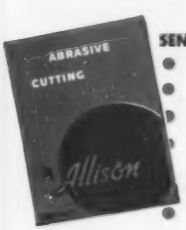

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BALESA

act. This happens in many companies, but it is not healthy. It indicates a slow-moving, sluggish-thinking company and one which does not successfully accomplish its aims. Harmony and clear-cut lines of authority are the keys to success.

Another reason and it, too, should be corrected, is that Johnson finds Al wanting and that Johnson has been pushed by his boss to do something about the situation. Not being properly trained or equipped to handle the plant manager's job, he takes this approach. He is not able to correct conditions and he cannot bring himself to discuss it with Al. This is a condition which exists in many companies both large and small. It is too bad that men are placed in responsible positions through graft, poor selection, or just taking care of the "relations" of the boss. Usually these men are not qualified to do the job correctly. They lack the know-how and can cause serious conditions and losses to a company.

A program on a national scale should be promoted to study the corrective measures needed to relax our business and again permit all of us to work for harmony and not be so pushed that we get on each other's nerves.

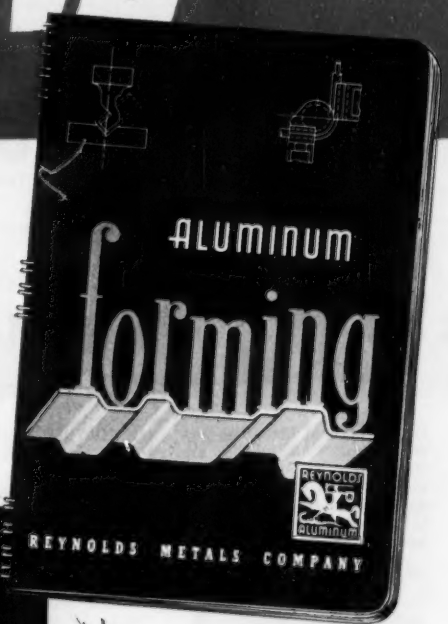
Charles D Townsend
West Hartford, Conn

FACTORY MANAGER JOHNSON is not being paid to do machinists' work; Al is quite right in resenting the interference with his men and Johnson should know better. It is possible that Johnson has come up through the shop and really knows the work and how accurate, fast production can be achieved. He is impatient to get his ideas functioning, but when he starts using his hands—perhaps to make a new fixture, or to lay out

"Never mind trying to beautify the department, George, let's just aim the coolant directly on our work."

"ALUMINUM FORMING"

Technical Handbook



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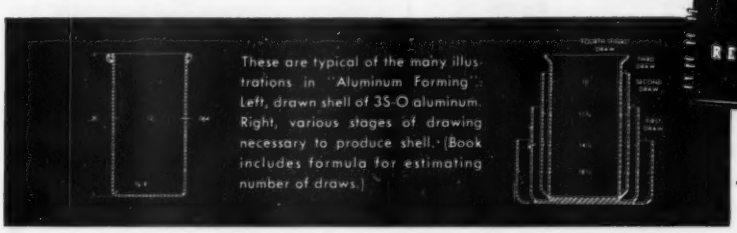
Everyone who works with aluminum should have this new 148 page handbook, the latest addition to the Reynolds Technical Library. "Aluminum Forming" was published so that design engineers and plant supervisors could have, in a single volume, complete information on the proper techniques for working aluminum. Design and fabricating practices with aluminum are not always like those for other metals. So, in some cases modifications or even special procedures may be required. This handbook fully explains all these procedures and includes more than two hundred and thirty drawings and photographs, twenty-two tables and thirty-two formulas.



These are typical of the many illustrations in "Aluminum Forming". Left, drawn shell of 35-O aluminum. Right, various stages of drawing necessary to produce shell. (Book includes formula for estimating number of draws.)

Be sure to see "Mister Peepers" every Sunday night, 7:30 EST, NBC-TV. Consult local listings for time and station.

For your free copy of the valuable Forming handbook plus a complete index of Reynolds technical literature, write on business letterhead (otherwise price of book is $1.00). Reynolds Metals Company, 2523 South Third Street, Louisville 1, Kentucky.

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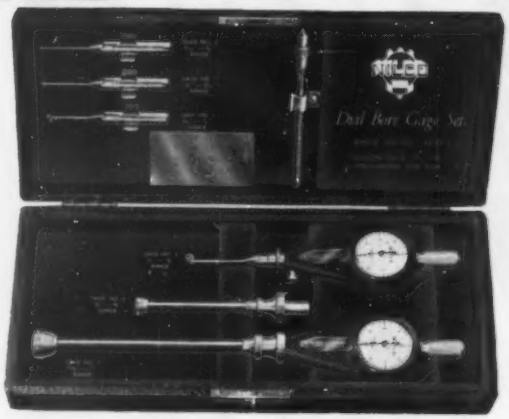

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Save on production costs! Operators using NILCO Dial Bore Gages see the condition of the holes and control the size right at the machine. Better parts and fewer rejects are the result.

NILSSON GAGE CO., INC.
Poughkeepsie, New York

Send for Nicholson Bulletins on These

3 WAYS TO SAVE TIME
in Production and Maintenance

On the basis of their time-saving records, leading shops are increasingly standardizing on these 3 Nicholson units. For details, send for the individual bulletins listed here.

NICHOLSON AIR TRAPS—For intercoolers, aftercoolers, receivers, tanks, etc. Feature non-plug and non-wire-drawing valve. Instantaneous operation and extra large drainage capacity effect fast, positive action. Catalog 953.

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NICHOLSON EXPANDING MANDRELS—Set of 14 does work of 209 solid arbors; sensational time savers in some operations. Sold singly or in sets; for bores ½" to 7". The standard in shops the nation over. Bulletin 653.

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work, then he is no longer a manager. It is his job to direct operations, not to do them. If he knows of a better way, then he should advise the department head as to what he wants done and see that his ideas are promptly put into operation.

It is not unusual to find that a factory manager who has risen through the various operating departments will have a strong urge to take a job from a worker and finish it himself, but this shows a weakness and the board of directors may feel doubtful that they have made a wise choice; thus the manager is handicapping himself.

There was the manager of a large malleable iron foundry who, in his youthful days, had been employed to fire one of the furnaces. The correct firing of a malleable iron furnace is an art in itself. After he became manager he would walk through the shops and when he saw that one of the stokers—perhaps a new man—was not spreading the coal properly, he would push the man aside and spend an hour or two showing him just how it should be done. He possibly thought he was a great manager, showing the men that he could step into any job around the plant and do it better than the man himself. He overlooked the fact that while he was demonstrating how to save a dollar's worth of coal he was holding up long distance calls, keeping important customers waiting and holding up business letters that should have caught the morning's mail, perhaps in all amounting to hundreds of dollars. The board of directors, however, did not overlook anything when they found out some of these things, for one afternoon he was called to the head office to explain why such acts had been considered necessary. Apparently his

"Verniers, comparators, micrometers, gage blocks, air gages . . . but try and find a simple yardstick!"

$3190

South Bend No. 2-H Precision Turret Lathe less electrical equipment, f.o.b. factory. Time payment terms 10% down, balance in 12 or 18 months.

A Better Value

SPECIFICATIONS

Hole through spindle	1⅜"
Maximum collet capacity	1"
Swing over bed	16¼"
Spindle speeds (Approx.)	20 to 945 r.p.m.
Effective feed of turret	5⅞"
Diameter of holes in turret head	1½"
Thread cutting range	4 to 224 per in.
Motor required (Two-Speed)	2 - 1 h.p.

The South Bend No. 2-H Turret Lathe has the stamina for exacting close-tolerance work, rigidity for producing fine finishes and ample power for smooth performance. It also has full quick change gear mechanism providing 48 power feeds for the turret ram, 48 power longitudinal feeds for the universal carriage and 48 power cross feeds for the double tool cross slide. The wide selection of feeds insures maximum machining efficiency on every type of operation. Where can you find a better turret lathe value?

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Three ways to order:

1. See or telephone nearest distributor.
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South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

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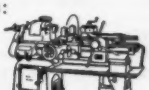
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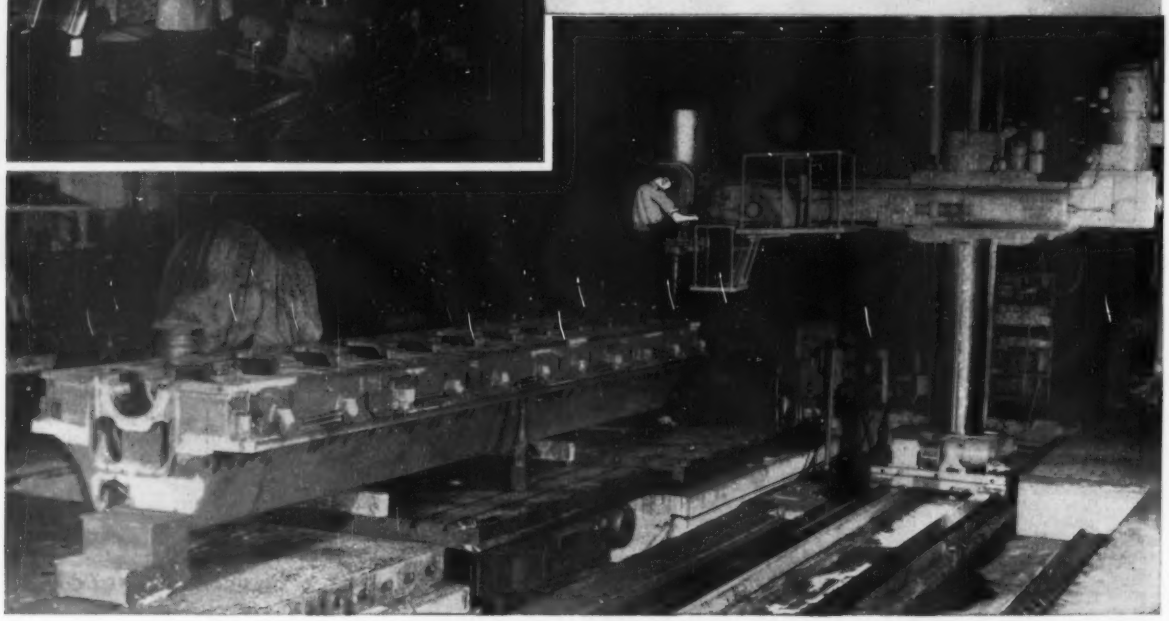


With extended column, runway and reach, this Kaukauna Universal Radial Drilling Machine is saving set-up time by drilling, tapping, driving studs and spot-facing with speed and accuracy from any angle on diesel engine bases and blocks.

Kaukauna builds Universal Radial Drills and Horizontal Drilling Machines in a range of sizes which meet practically all requirements in modern production practice. Write today for descriptive catalog or ask representative to call.

KMC Kaukauna MACHINE CORPORATION

KAUKAUNA, WISCONSIN, U. S. A.

explanation was not convincing for he never returned to the manager's chair; in fact he never again was in that plant.

It is not intended to imply that a good manager is one who spends all his time in his office from where he directs all departments by phone or written orders. A good manager should certainly take frequent trips around the plant and this should include the washrooms, toilets, warehouses and storage. It is surprising how much a keen-sighted manager can learn by such trips and how much the employees will appreciate it if the toilets and washrooms are kept spick and span.

Al, of course, cannot safely criticize his manager, but he can use a little diplomacy. For instance, whenever Johnson comes into Al's department he can promptly go to him and ask advice on some small matter. Should Johnson then start working on some item, Al could call one of his men and say, "Mr. Johnson, if you will tell Bill here just how you want that done, he will finish it for you and bring it to your office. Bill is a first-class workman and I am sure he will do a good job for you." A smooth suggestion like this generally works, and since Bill will charge his time to "special work for manager," this reduces the department cost and helps Al. Johnson will soon go to some other department to do his tinkering, which will please Al no end.

George P Pearce
Albuquerque, NM

HOTSHOT FATHEAD

Is there any solution to the problem of trying to maintain peace in the department if you have a first-class machinist who won't keep that fact to himself? Is it better to fire the man, or try to point out to him that his arrogance infuriates everyone else?

THE CASE OF A HOTSHOT FATHEAD has kept many a foreman awake at night trying to figure out a solution to this problem, and it is a very tough problem at that. No foreman wants to lose a good man, but on the other hand he cannot afford to keep a troublebrewer in the gang. Men who are annoyed and resentful cannot be assembled into a smooth-running organization and as long as the conceited, arrogant chap is around, no harmony is going to exist. There is, however, one factor that must not be forgotten: the obnoxious man has a high order of intelligence and he generally can be tackled from that angle.

Al should have a private talk with

THE SUPERINTENDENT REPORTS TO THE GENERAL MANAGER

"Thanks to Farval, we're 375,938 hours ahead!"

IN a Detroit manufacturing plant, oiling machinery by hand took 11 men, or 27,456 man hours per year. In 1937 management installed 133 Farval systems to serve the 3100 bearings on its metal-forming presses.

Except for re-filling reservoirs, Farval completely eliminated the "human element" and over 15 years has saved the company 375,938 man hours—valued at $537,591 at prevailing labor rates.

In addition, the foreman reports not one shutdown for bearing replacement or repair due to faulty lubrication.

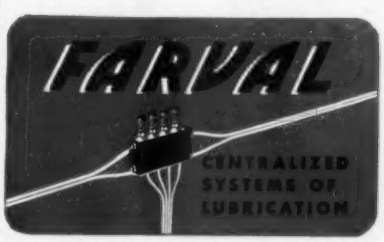
Farval is the Dualine system of centralized lubrication that hydraulically delivers oil or grease to each individual bearing, exactly measured, as often as desired. Today Farval systems protect millions of industrial bearings throughout the world.

FREE LUBRICATION SURVEY—Without obligation, let us send one of our expert lubrication engineers to inspect your plant equipment. He'll present recommendations in writing to show how Farval can save you money. Just mail coupon below or write us a note.

KEYS TO ADEQUATE LUBRICATION—Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Above: Some of the Farvalized presses in operation. At top, superintendent demonstrates action of Farval valve with cutaway section. This valve has only two moving parts, is individually adjusted to deliver any desired amount of oil or grease to the bearing.

Farval is an affiliate of The Cleveland Worm & Gear Co. Manufacturers of industrial worm gearing.



The Farval Corporation, 3254 East 80th Street, Cleveland 4, Ohio

Send Farval Bulletin 25 and details of your free lubrication survey.

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ONLY CURTIS OFFERS ALL THESE BENEFITS

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As near to you as your telephone

A MANUFACTURER OF UNIVERSAL JOINTS SINCE 1919

Smith and tell him that while he is an excellent workman so far as fast workmanship is concerned, he is failing to make the grade on account of his snooty ways and that they have now come to a point that Al can neither overlook nor tolerate. A good workman, Al should explain, is not necessarily an asset to the firm unless he can get along with his fellowmen and work in harmony with them. The seriousness of the situation should be explained to Smith and he should be told that he will be given a month to adopt a more cooperative attitude or he will force his own elimination.

A quiet, intense talk like this will generally cause the offender to realize that he is actually putting the brakes on his own progress and cause him to change his own tactics and in time become one of the gang. If, on the other hand, Smith takes affront and threatens to quit, then the best thing is to let him do just that, because no man is irreplaceable and a trouble-brewer is a continual source of increased expenses and retarded output of the department as a whole. A smooth-running shop is more important to the firm than one employee, even if he is able to turn out top production.

There was the case of the expert who rifled the big Navy guns at a well-known gun manufacturing plant. This man (Tom was his name) was always openly bragging that he was the most important man in the plant since the output of guns depended entirely on him. There was no doubt but that his job was important, for the slightest slip in the rifling operation could mean the scrapping of the almost-completed gun. The works manager kept hearing about this talk of an indispensable man and got fed up with it. He sent for the man and told him that he, the manager, had become worried as to what could be done to con-

"Won't come off. Next time you sit down don't sit on the glue pot."

Here's what we think of Frantz Magnetic Separators

Following are some typical comments by users of the **FRANTZ**

FERRO FILTER®

on operations such as

DRILLING . . . . . "Maintenance cut 90%."

TAPPING . . . . . "Cleaner threads; longer tap life."

GRINDING . . . . . "Gets better finishes."

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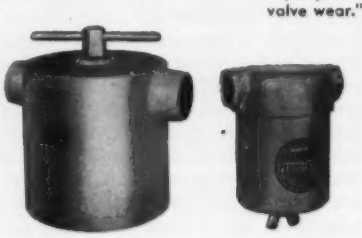
HYDRAULIC PRESS . . . "Saves pump and valve wear."



Model PQ-4 and larger — Model PQ-3 and smaller

Frantz Magnetic Separators may be the solution to many of your production and maintenance problems. For complete information.

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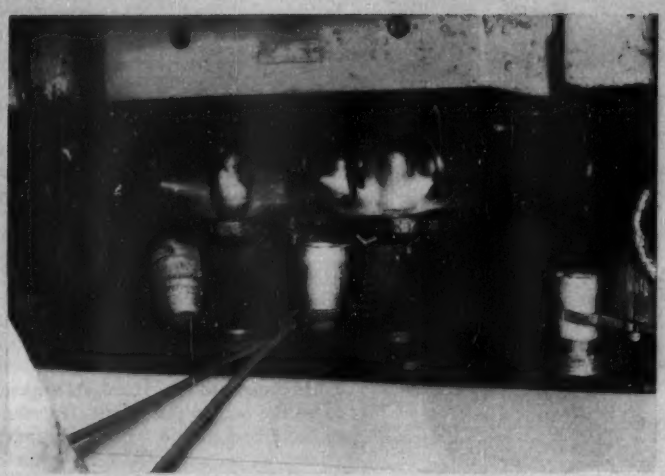
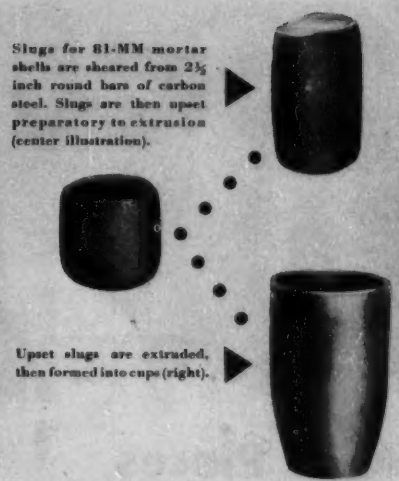
S. G. FRANTZ CO., INC.

P. O. Box 1138 Trenton 6, N. J.

500 81-MM Shell Blanks Per Hour on a 1,600-Ton High Speed Forging Maxipres!



Upset slugs, heated to 2100°F., are cupped by extrusion, then shaped in forming die. High-pressure jets of mixed air and water keep punches and dies cooled to about 550°F.



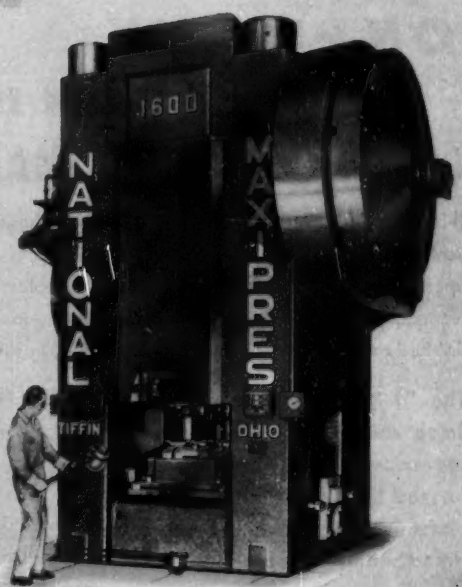
Slugs for 81-MM mortar shells are sheared from 2½ inch round bars of carbon steel. Slugs are then upset preparatory to extrusion (center illustration).

Upset slugs are extruded, then formed into cups (right).

● An outstanding production record is being established at Rheem Mfg. Co., progressive West Coast ordnance forgers, where 81-MM mortar shell blanks are being forged on a 1,600-ton National MAXIPRES at the rate of 500 blanks per hour!

Dies, developed in cooperation with NATIONAL engineers, are giving exceptionally long service. The punches have produced 14,000 to 16,000 pieces, average. After forming 15,000 cups, one die was polished, and produced another 63,000 pieces before showing much wear!

If you have a forging problem—large or small, hot or cold, ferrous or non-ferrous—let us help you solve it. Send us prints, or a sample part, or, better yet, visit us. No obligation.



MAXIPRESSES are available in 13 sizes from 300- to 8,000-ton.

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More Pieces COMPLETELY *finished in less time on* GOSS & DeLEEUW AUTOMATIC CHUCKERS

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The "1-2-3" exclusive Goss & DeLeeuw feature provides for finish machining three ends of a part simultaneously or in sequence. All operations are performed in a single set-up, and complete finishing done in much shorter time than by conventional methods.

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Send for illustrated literature which fully describes this recent Goss & DeLeeuw development in chuckers. Submit samples of your work for time and cost estimates.

GOSS & DeLEEUW

GOSS and DE LEEUW
MACHINE COMPANY, KENSINGTON, CONN., U.S.A

tinue production if Tom should be taken sick and be unable to work for a time. Tom admitted it could be tough for the firm because no one could rifle a barrel like he could.

"That's just what I am afraid of," continued the manager, "so while you are well I am going to find out. You are going to be laid off so we can discover what we can do, and if we find that we cannot get along without you then I am going to offer you just double the rate you are getting now and ask you to return. Now do you want to try this out or will you quit all your bragging to other employees and just attend to your job and stop all the big talk."

Tom chose to quit bragging and he worked for fifteen more years before he was retired; but there was no more big talk.

George P Pearce
Albuquerque, NM

IT SEEMS THAT A BOOK on peculiar characters one finds in machine shops would make an interesting contribution to literature. Al appears to be the one to put it out. He seems to have brought to light a character whom we all have had the pain of listening to at one time or another. The Hotshot Fathead would make a good one to climax his efforts.

I don't think that there is a person who is more disturbing, more disorganizing, than this big-headed blowhard, unless it be an agitator who is of the opinion that the workers receive one hundred percent of the firm's earnings.

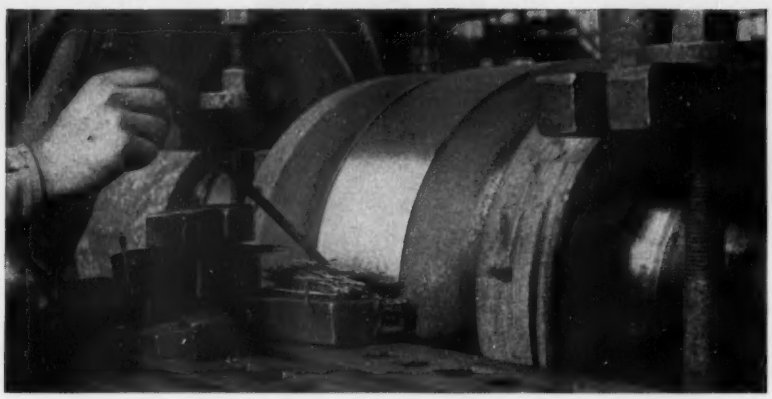
Ordinarily you'll find this peculiar product of Creation—this wind-stuffed, metamorphic jackass usually found bedecked in a starched, white apron and striped trousers—is a person who innately compensates for some other failing by turning on the compensator with his loud-mouthed outbursts. This braying "I'm-me" switches on the booster pump when-

"I thought a good place to start would be right here."

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Red Sabre Bit Does Double Duty

Roll-dressing in a mill where steel bars are rolled had long been considered an operation requiring two types of tool steels. For the roughing cuts they used tool bits made of high-speed steel. And for the finishing cuts, they turned to water-hardening steels.

But someone got to thinking, Why not try Red Sabre? Then maybe one tool steel could be used for both jobs.

So Red Sabre was put to work, and is giving an excellent account of itself on alloy-iron and cast-steel rolls having a hardness of 48 to 60 Shore.

The roughing operation is shown above. The hardened-and-ground block-cutter tool, 1¼ in. high, 1½ in. wide, and 8¼ in. long, and with four cutting edges, is making a cut approximately .006 in. deep. The finishing cut, less than .001 in. deep, is made without changing the tool set-up. Both operations are performed at a surface speed of 40 in. to 60 in. per minute, depending on the diameter of the roll.

Red Sabre is our super-high-speed steel, containing approximately 1.50 carbon, 12.00 tungsten, 5.00 vanadium and 5.00 cobalt. It is unusually resistant to abrasion and wear, and has higher red-hardness than most high-speed steels.

Red Sabre tool bits, hardened to a minimum of Rockwell C-65 and accurately ground, are stocked in all standard sizes. If you'd like to try them out in your shop, put it up to your tool steel distributor. Or if you prefer, order direct from us at Bethlehem, Pa.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

This Is Why We Anneal Most Tool Steel Bars

In the majority of cases, bars of Bethlehem tool steel are furnished in the annealed condition, both to users and distributors. There are two important reasons why this is so:

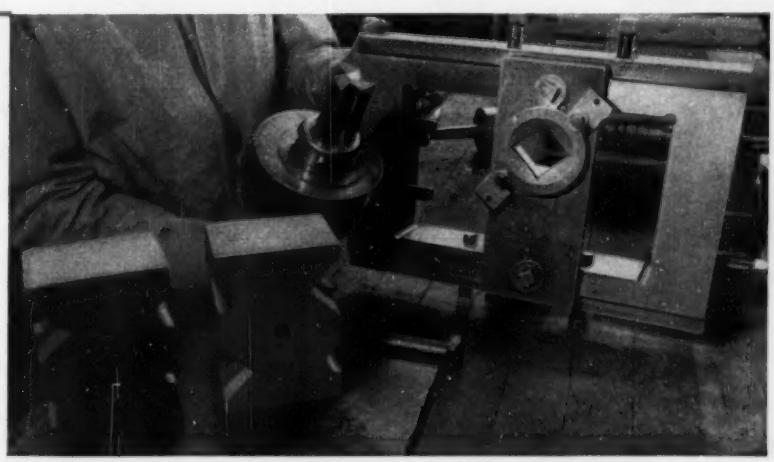
1. The process of annealing makes it possible to remove the stresses occurring in the as-rolled or as-forged bars. If such stresses were not removed, they could very well lead to cracking, resulting in delay and increased shop costs

2. With many types of tool steels, it is necessary to obtain the lowest degree of hardness in order to secure the best machinability. But for other grades of tool steels, low hardness is undesirable. For this reason, annealing is carefully controlled to produce the proper degree of hardness for the grade involved.

Here's another point to remember—excessive scaling and decarburization must be avoided during annealing. We find the bell-type, controlled-atmosphere furnaces used in our tool-steel mill excellent for this purpose. In fact, with these furnaces we obtain results which are far superior to what is possible when other types of annealing equipment are used.

MACHINE BOLT FORMING DIES MADE OF CR-MO-W

Making forming dies which are capable of turning out thousands of square-head machine bolts each day is a task calling for a top-notch grade of tool steel. That's why Bethlehem Pacific, the largest maker of bolts on the West Coast, selected Cr-Mo-W (Chrome-Moly-Tungsten) tool steel for making dies used in bolt manufacture. Like many other tool-steel users, they find Cr-Mo-W ideal for jobs involving shock or drastic temperature changes, as well as for applications where heat-checking is a problem. Cr-Mo-W, our general-purpose type of hot-work tool steel, is air-hardening, and has good red-hardness and good machinability.



Drill jigs and other fixtures are simpler, cheaper, smaller when made for use in a SPEED VISE. Instead of a cumbersome and expensive box jig, with a SPEED VISE it is only necessary to make a simple jaw plate to fit the part being machined and hold drill bushings, etc.

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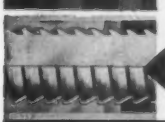
STANDARDIZED HOLES for attaching jigs or jaw plates are provided in the jaws of all SPEED VISES.

HARDENED STEEL is used on the screw and locking nut to provide minimum wear and extra long life.

HEAVY SEMI-STEEL CASTINGS for extra strength and a heavy base plate for rigidity are part of the SPEED VISE construction.



PATENTED THREAD FORM of the screw and nut is a steep undercut. Screw is held positively in the nut when the vise is clamped.

Write for Bulletin No. 24-AM

CARDINAL MACHINE COMPANY

1819 Dana Street
Glendale, California

ever he feels a spell of inferiority coming over him and gloats in the satisfaction that he is the big "I am."

Wouldn't it be a thrill to be able to dissect one of these self-cocked Homosapiens—take it apart like one would an Ingersoll watch—to see what sort of a mechanism exists within that fathead to make him feel and act as he does. A psychiatrist would tell us that his high potential is a coverup for something or other that he fears will be divulged to others.

I can readily understand why Al's pet feels as he does. No doubt this misguided foreman has contributed materially in building up the man's ego by humoring him into feeling that he was the only person who could operate his pet machine. Naturally the guy is going to treat it like his own toy and make it known to the other men around him that they are as worms and second-raters. We usually have a great desire to knock hell out of a kid for behaving as he does, and fail to take into consideration that his parent is responsible for it. I liken Bigshot Fathead's foreman to the erring parent.

I'd like to recall a few of these so-called hotshots whom I have encountered in my days of activity. One was an overgrown slob—Fatso, the boys called him—who did most of his work sitting down. In the two years I worked with this piker I never heard of him approving of anything—every damn thing was either treated with a shrug of the shoulder or an expression of derogation. "Ah, that's no damn good; here's the way it should be done," was his favorite expression. The fellows would waste the company time by going out of their way to avoid him so that he could bathe in the warm atmosphere of his own glory. Fatso wasn't such a hotshot of a mechanic but he enabled the boss to tolerate him by pay-

(Advertisement)

metal chippings...

by
Frans Ls. Meyjes, C. E.

At the beginning of this new year it would certainly help us all to know exactly where the American metal-working industry is going. With this in mind, I checked recently with a number of friends and associates in big business and small to get some idea of how they felt.

★ ★ ★

While most of them, it seems, were pretty pessimistic as recently as the beginning of last September, they now believe that in 1954 we're not going to see a decline in business volume of more than 5% below that of 1953.

★ ★ ★

They say, first of all, that although the government is slowly cutting down on spending, that fact will not necessarily mean that defense appropriations will decline, too. In 1953 our defense spending was above 1952's; and in 1954 it could well go over the mark set in 1953.

★ ★ ★

Some of the professional pessimists have been pointing out that steel—always a good business barometer—is down in capacity. While this is true, the fact is that the industry is producing more steel than it did a year ago. Steel capacity at its present 95% is even better than what it was during the peak war period. At that time it never went higher than 94%.

★ ★ ★

Above all, my friends told me, we must avoid the possibility of talking ourselves into a depression. We, here at ASCO, believe so firmly in the future that we're letting nothing deter us from our plans for expanding our production facilities in 1954!

Frans Meyjes, Vice President in charge of Production of ANTON Smit & Co., Inc., is also director of the Applications Engineering Division. The purpose of this division is to furnish free technical help to the mining industry on its specific diamond drilling problems. Call on your local ASCO Applications Engineer—or write the ASCO World Headquarters in New York—if you'd like to discover how to get . . . MORE FOOTAGE FOR YOUR DOLLAR!

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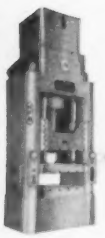
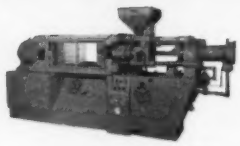
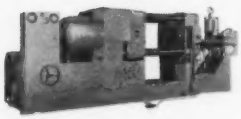
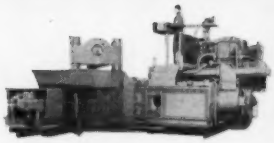

Metal Working

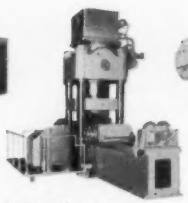
Blocking & Briquetting


Injection Molding

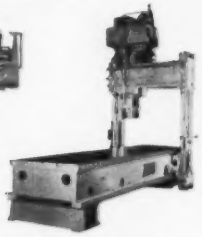

Die Casting

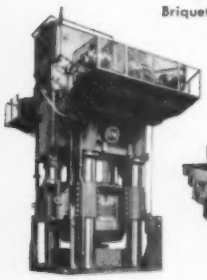

Scrap Baling

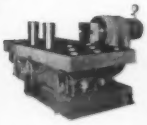
Compression & Transfer Molding


Shaft Straightening

Rayon Steeping


Two-way Straightening

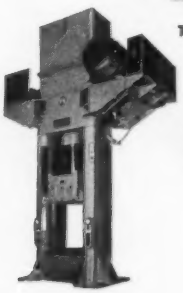

Rubber Pad Forming

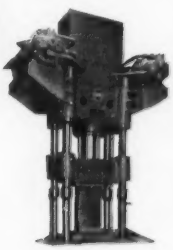

Bending

Reinforced Plastics Molding

Cartridge Case

Cold Extrusion


Shell Forging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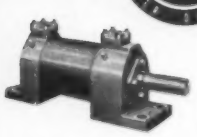

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ing strict attention to his work.

Another fathead, an exceptionally good mechanic, was one who couldn't be persuaded to make anything any way other than how *he* thought it should be done. He had a peculiar stare in his eyes as he voiced his opinion, which makes me feel, as I recall him, that he sort of mesmerized the fellows into thinking that he was a wizard at anything he undertook to do. For some unaccountable reason this hotshot fathead seemed to have a pretty good following among the boys in the shop. He, fortunately, augmented his braggadocio with an occasional burst of humor. When he first put me under his spell I was under the impression that he was a bluffer, but that idea was soon dispelled when I found out that he knew his work like an expert and could perform with exceptional skill and dispatch. But oh, how that bird could lay it out without the aid of a wide shovel! The foreman conceived of a plan to capitalize on his ego and put him in charge of four men in the department. The fellow was a wizard at renovating machinery and conveyed his skill and experience on to the others which in turn contributed considerable benefit to the firm.

So, I'm convinced that were the shop foremen on their toes to detect potentialities in their men, regardless of their safety-valve qualities, considerable gain would accrue.

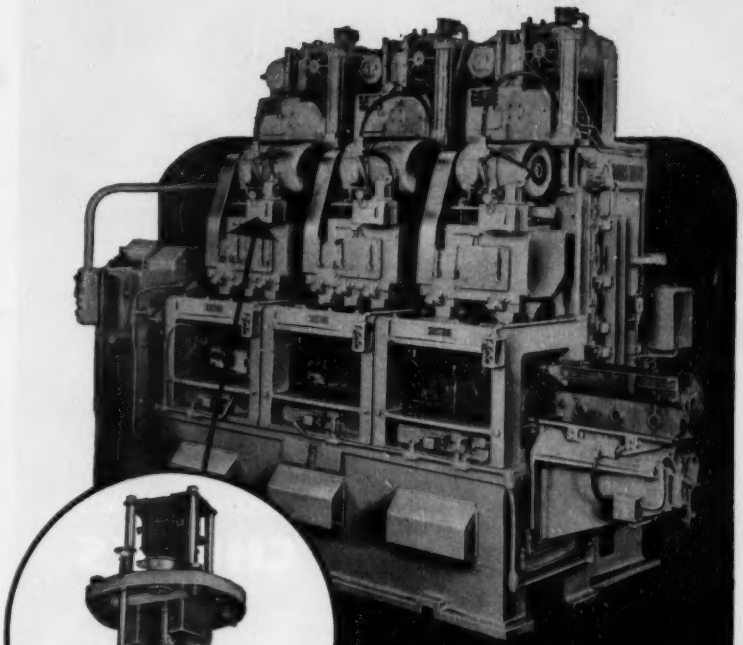
Frank Van Horn
Auburn, Calif

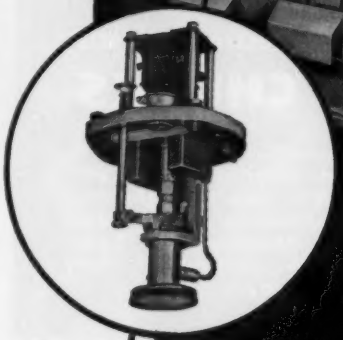
IF AL DOESN'T TAKE the bull by the horns, he will find he has lost the respect of his men. The loss of a man is never as important as keeping the morale of one's department up.

I remember two cases that gave us a lot of trouble; one was way back at the time of World War I. We had a diemaker who was a very good workman, but he had an exaggerated

"He started the day out wrong — got up."

VERSATILE *lubrication*





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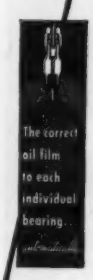

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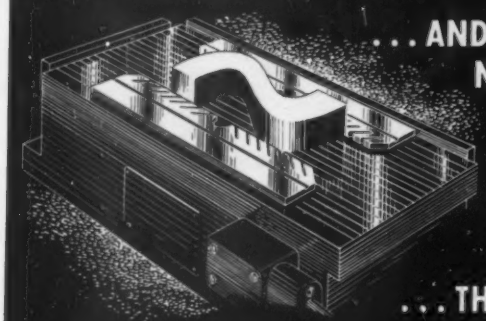

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ego; he thought no one knew anything about dies but himself. He went so far as to try to make the foreman look ridiculous before the men. This man was brought up sharp by giving him his walking papers.

Another man, also a good workman, thought he could get away with murder. He soldiered on the job, sold candy and merchandise on the company's time, which was strictly against company rules, and made himself a general nuisance. Needless to say we stood it for quite a while but we finally gave him the sack. He was so unpopular that even his union was glad he was out.

When Al talks of losing a jig-borer hand he should remember that one can teach a man with a little knowledge of simple mathematics to run a borer in less than a month. We did this on a number of occasions with good results.

No man is so valuable that he can upset the tranquility of a whole department.

William C Betz
New Britain, Conn

THE KNOW-IT-ALL attitude has ruined many a person. It gets them into hot water in so many instances, but sometimes there seems no solution or cure for them. If we production men were doctors, we would undoubtedly try to get to the root of the problem. There always is an answer, but whether upon finding it, you can free the person of his obnoxiousness is another problem.

Nine times out of ten the guy that hollers the loudest about how good he is, and how much he does, and how important his position is, can be analyzed as a person who actually is only average but due to some outside pressure has taken this manner to cover up. He thinks he is being a big shot—little does he realize that men of importance do not have to talk,

"Chip says, either the plug gage is too large or he has been working from the wrong blueprint."

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and are promoted by others. Nevertheless, as supervisors of men and women in productive work, we are faced with this type of individual.

The solution sometimes lies in uncovering that depressed area in the individual and talking him out of his attitude. This takes time, for attitudes are built up over long periods and become habits very difficult to break down. It seems to the individual that he is being thrown to the wolves. He thinks that by acting naturally he would be losing ground, and that people would not notice him. If he would only realize that actions speak louder than words, that by doing a good, fast job he would be recognized by the people around him and looked up to and admired. Instead, he yells about how good he is and makes himself a general nuisance. People around him are disgusted and he becomes distasteful to the whole organization.

How do we cure this sort of fellow? Should we try talking? Yes, if you as a foreman or supervisor feel that you have in your hands the actual answer to unlock the problem. Otherwise it is better to first call the individual into the office, tell him he is causing trouble by being a showoff. Give him some suggestions on how to behave more normally among his fellow workers and definitely warn him to improve or he's out. If the attitude is not too ingrained, this might snap the person out of it. Further, it might be well to investigate his background in other jobs more carefully. Did he lose them because of the same trouble?

Sometimes shock will solve the problem of overbearingness. But if your efforts at finding a solution fail, don't just sit the matter out. Take the necessary steps to remove the individual that is upsetting your organization. If you don't want to just up and fire him, then insult his ego by the jobs you place him on. He will probably quit on his own, or he will snap out of his attitude.

It is hard to decide sometimes which is worse—losing a worker or having a disrupted shop. But even though your loss may slow down production momentarily, the replacement may be a man who does even better work than the first man. Maybe he will act as a new spark and cause the entire department to make up for lost time; this has happened. Never keep a shop upset, for it means lost production. Don't feel that an effort should not be made to save good men from going wrong; it is those with too well-rooted habits who frequently can't be changed. The training of men costs money, but so

does lost production and the loss of the other workmen due to unpleasant working conditions. Think your problem over and then act upon it. Keep your entire shop happy, not just one person.

Charles D Townsend
West Hartford, Conn

HERE WE ARE with another problem that has caused upset feelings between workmen and also between workman and supervisor. It is one of those problems that causes us (if we aren't careful) to be the enforcer rather than the leader.

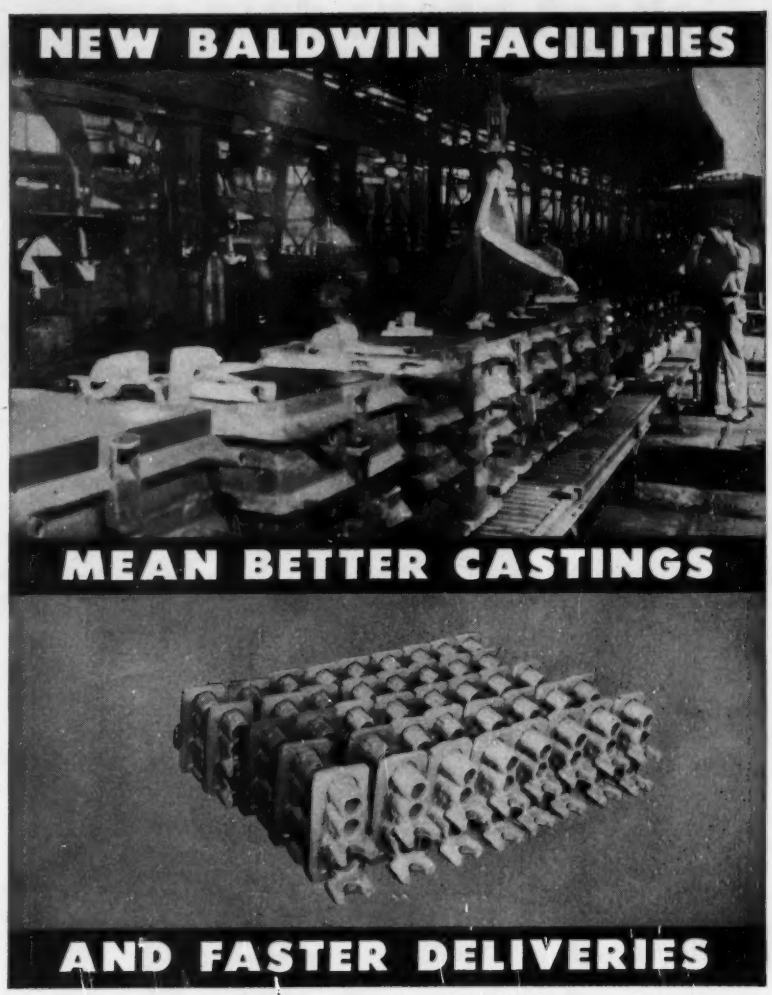
This type of hotshot blowpipe with the personal "I" "I" "I" is a goat-getter. This employee is trying to force people to recognize him. No one ever told him that to make people interested in him he must first be interested in them.

To a lesser degree we all have this fault. We have neighbors who do without something else to get a new car each year; other people want the latest style clothes. Some build homes larger than they will ever need. Many criminals are filled with ego; they want attention. They love to see their name in the papers. People do amazing things to focus attention on themselves. They are hungry for that feeling of importance.

This man is admittedly a good mechanic and would be hard to replace. He is worth saving. To fire him would be a mistake, to down-grade him is even worse. Here is a plan that works like magic. Call this man into the office and let him know you appreciate the fine work he is doing. Tell him you want him on your team; praise his ability in handling difficult jobs, and his other good qualities. Tell him you don't want to lose him, but that you must have peace in the department. Tell him he must stop annoying the other men. Put him on probation. This is a good way to cure a fault, but at the same time give the employee a feeling of importance.

A E Salmons
Philadelphia, Pa

"Yeah. . . . they broke."



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2. Baldwin is now able to produce even finer quality castings which cost you much less to finish. This high quality is assured by the uniform machine packed molds, engineered gates and risers, and better control of pouring temperatures. (Note in the upper photo how the molds are arranged so that one tap can be used up before the temperature falls appreciably.)

You, too, can get *quick* deliveries on castings as clean and smooth as the intricate diesel-engine valve guides in the lower photo. For details about the 110 brass and 20 iron alloys available, write Dept. 5702, Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

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Philadelphia 42, Pa. • Offices in Principal Cities

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ABRASIVE BELTS

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber.

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Massachusetts

SUPER SALESMAN

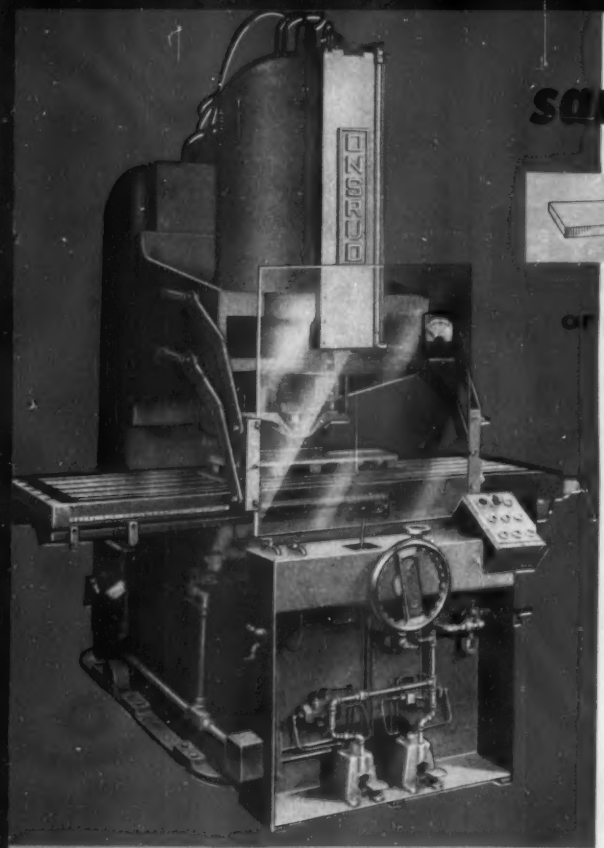
How much leeway should the salesman be allowed in the shop? Once he has gained the foreman's confidence, should he be permitted to talk individually to the workers, or must his visits always be supervised?

AN ENGINEERING SALESMAN has no more right to walk into the shop and talk to the workmen than has a seller of hair oil or hand-painted girlie ties, but no engineering salesman from a reputable company is apt to try it. The proper procedure, of course, is to first obtain permission from the management, and then interest the foreman and ask him for permission to show the workmen who would be involved the improvement in method, new process, or whatever the items are he is trying to bring to the attention of the firm. A good engineering salesman often can do a great deal towards cutting costs and improving output, and for this reason Ed is very likely to miss some time—and material-savers if he does not pay sincere attention to what the salesman has to offer and listen carefully to his proposition.

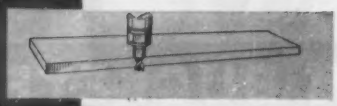
When a new job comes in which involves quantity production it is generally advantageous to invite engineering salesmen who specialize in this type of output to make proposals to supply suitable equipment for rapid, accurate production. Trying to use an old milling machine or a worn-out gear cutter to save the cost of a new, modern, powerful machine can easily be the difference between a good profit and a loss on a large order. A good engineering salesman will not only be able to state what the rate of production of the machine he offers will be, but he will also guarantee this rate, and be prepared to train the operator to deliver the promised output.

A progressive foreman will welcome engineering salesmen for they can help him get top production but, of course, the foreman must make his own analysis as to whether or not the salesman's proposal will result in sufficiently greater production, or lower costs for material, or both. If the money invested in the new equipment cannot be earned back quickly enough to beat the depreciation and show a profit, then the investment would be a mistake. That is the foreman's job to determine, and his progress or failure with the company often depends upon his good judgment in this matter.

To some extent Al is right in saying that engineering salesmen should be permitted to go into the shop and



same high speed feeds



in straight line

or profiles

with

Onsrud®

InvOmil (TM)

Profile Milling Machines

for aluminum and similar non-ferrous metals

Spindle speeds of 7,200 to 14,400 RPM plus electronic coordination of feeds, give production speeds unequalled in aluminum profile milling. Whatever the curve or contour, cutter head and table feeds remain constant without slow down or stopping, even for a 90° corner! Follower of cutter head travels along template, for precision duplication of contour on work. Patented Onsrud Coordinated Feed design, combines table longitudinal and transverse feeds with rotary InvOmil head feed into one electronically synchronized feed system...easily controlled by operator. Your inquiry is invited.

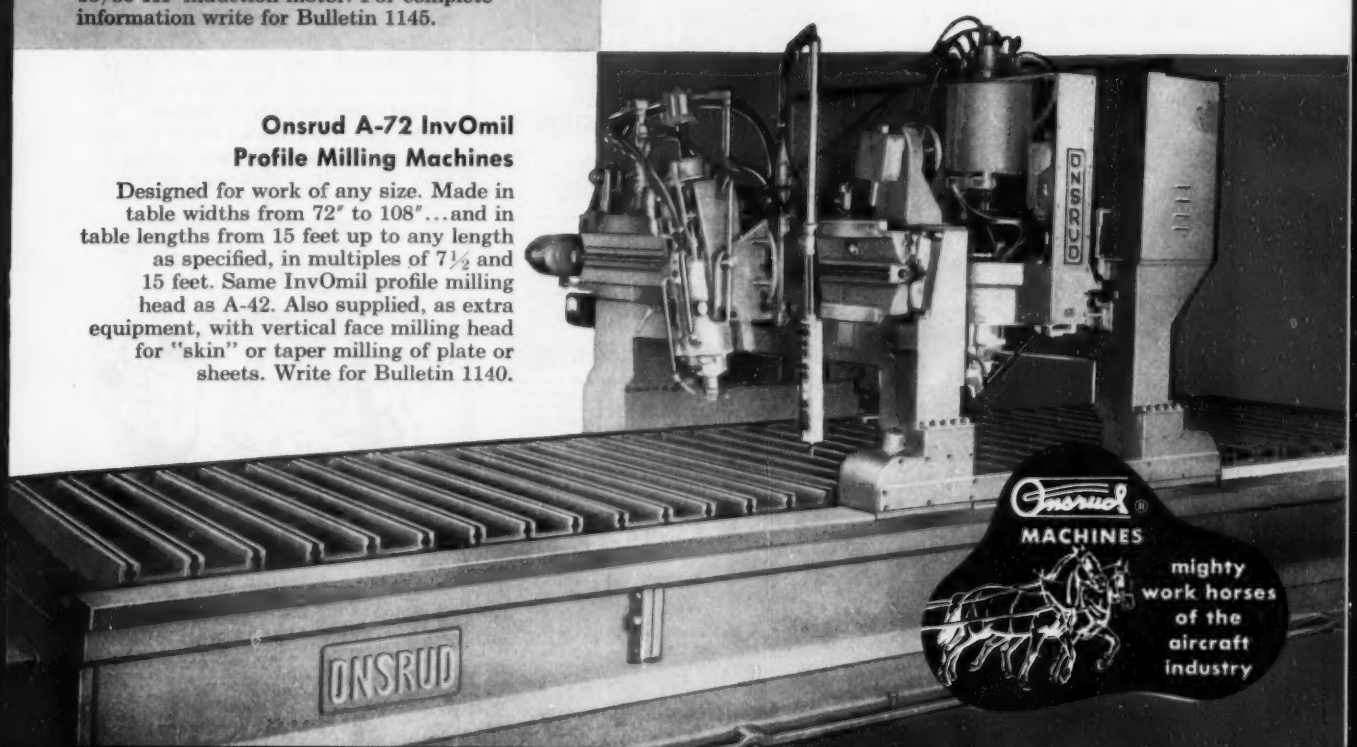
ONSRUD MACHINE WORKS, INC.
3921 Palmer Street • Chicago 47, Illinois

Onsrud A-42 InvOmil Profile Milling Machines

Supplied with 80″ or 98″ tables for longitudinal feeds of up to 42″ and 60″ maximum. Transverse feed up to 12″. Ruggedly built machine for heavy duty profile milling of aluminum plate, sheets, forgings, castings or formed parts. Direct cutter drive by Onsrud air cooled, two-speed 7,200/14,000 RPM, 15/30 HP induction motor. For complete information write for Bulletin 1145.

Onsrud A-72 InvOmil Profile Milling Machines

Designed for work of any size. Made in table widths from 72″ to 108″...and in table lengths from 15 feet up to any length as specified, in multiples of 7½ and 15 feet. Same InvOmil profile milling head as A-42. Also supplied, as extra equipment, with vertical face milling head for "skin" or taper milling of plate or sheets. Write for Bulletin 1140.



in air turbine grinders

YOUR BEST BUY IS BUCKEYE

here's a brand new air turbine grinder especially for carbide cutting!

FAST—
55,000 RPM
POWERFUL—
Full ¼ HP
LIGHTWEIGHT—
Just 1¾ Lbs.

More power per pound! That's the reason the NEW Buckeye Air Turbine Grinder will cut through grinding jobs faster, with less effort for the tool operator. Versatile—designed for use with tungsten carbide burrs, adaptable to use with rotary files and midget mills, may be mounted on tool post, takes mounted points up to ¼" shank.

Write NOW for complete information on this NEW addition to the Buckeye Tools line of 56 portable air-powered grinders.

bearings sealed in grease—
NEVER REQUIRE LUBRICATION
use with tool post holder—
MORE ACCURATE GRINDING
efficient turbine bucket design—ALWAYS RUNS COOL
operates without vibration—
EASY TO HANDLE
aluminum housing, steel front sleeve for longer wear—
LIGHTWEIGHT, DURABLE

Buckeye Tools CORPORATION
DIVISION 15 • DAYTON 1, OHIO

producers of the world's first successful rotary air tools

talk with the men. Only those salesmen who have something to offer which apparently might benefit shop production should be granted this privilege, however. The shop men's opinion of the equipment is a valuable aid to the foreman in arriving at a decision, for men on that type of production generally can pick flaws in a proposed new machine quicker and better than the foreman. The machinist knows every detail of the work, whereas the foreman has only the overall picture.

Salesmen frequently hand out small favors to people who may eventually operate or use their equipment, and so long as the favor does not represent a high value—so it might be a bribe—then there should be no objection. The salesman is only trying to get good will on the actual user's part so he will attempt to get the maximum production should the equipment finally be purchased, and surely no foreman has any serious objections to that.

Technically - trained engineering salesmen are able to give valuable information and suggestions, and visits from them should be encouraged for they can aid a lot in keeping the shop in the lead particularly if the foreman has good judgment and knows when to propose buying to the management and when to say no. A foreman who has this ability is an exceptionally good man, as I am sure Ed as well as Al will agree.

George P Pearce
Albuquerque, NM

THE DAYS IN WHICH the salesman leaned against the cracker barrel, puffing on a five-center as he filled his listeners with yarns so as to prepare the way for his climax on the dotted line, are gone forever. He didn't need to have so much knowledge of the thing he was selling so long as he had sufficient farmer's-

"I can detect a veiled note of sarcasm in it though — the boss giving us loafer coats for Christmas."

daughter-and-salesman stories to leadfoot his way into his prospect's heart.

Like the famous Dodo, the yarn-spilling drummer of old is a thing of the past and in his place we have the salesman who is up on the materials he is trying to sell. Some resort to honorable means of disposing of their product, and others do everything short of murder to gain a headway. The newest thing seems to be the use of the employee wedge.

There is no harm in a salesman giving out information to the men in the shop providing he does it in a way that doesn't interfere with normal production procedure. He should make it a point in properly evaluating time of the employees and consider the detrimental effect of putting ideas in their heads that will interfere with the influence of their foreman.

In his wanderings throughout the country he comes across many ideas of benefit to the men—that is, he enlightens them in some things that they would not get otherwise. For instance, he may come in contact with a grinder hand and, being an expert on grinding wheels, immediately detects that the man is using the wrong wheel for the work he is doing. He may remark, let us say, that the operator would do a better job were he to use a softer wheel. This could be nothing more than a friendly hint. However, the question is, should the man be allowed in the shop at all?

Especially at a time like the present, when it is incumbent on all of us to be extra vigilant as to who should be allowed to trespass, is it necessary to establish strict rules—on salesmen or anybody else—that anyone not directly connected with the shop should be prevented from gaining entrance. A slick tongue may cover up a lot of subversive material.

Would it not be better for the salesman to confine himself to the foreman's office? The danger of let-

"What's this talk about a gadget to keep employees on their job?"

NOW

Wells offers you fool-proof blade tensioning . . .

At left is a close-up of the new Wells blade tensioning device—simple, yet positive and fool-proof. Below is a Model 800 with blade tensioning.

on Wells No. 5, No. 8, No. 12 and Model 800 cut-off saws

NOW IT IS POSSIBLE to maintain a constant blade tension on Wells cut-off saws. You can replace or change the blade any number of times, yet quickly and easily duplicate the correct blade tension. The new device is standard equipment on the models listed above. Simply turn the tension hand wheel until the fixed and moving indices coincide. At this point the blade tension is correct regardless of a variation in the length of the blade.

The incorporation of this blade tensioning device into Wells Saws eliminates the guesswork in blade tensioning. It means longer blade life and better cutting. Only Wells Manufacturing Corp. offers you this remarkable advancement in horizontal metal cutting band saws.

Ask your Wells Distributor to give you full information, or write for descriptive literature.

CAPACITIES OF WELLS SAWS AVAILABLE WITH BLADE TENSIONING

MODEL	CAPACITY	
	Rectangular	Rd. Dia.
No. 5	5" x 10"	5"
No. 8	8" x 16"	8"
No. 12	12" x 16"	12¾"
800*	8" x 16"	8"

*Designed for 1" wide blades and approved for use with new high speed steel blade.

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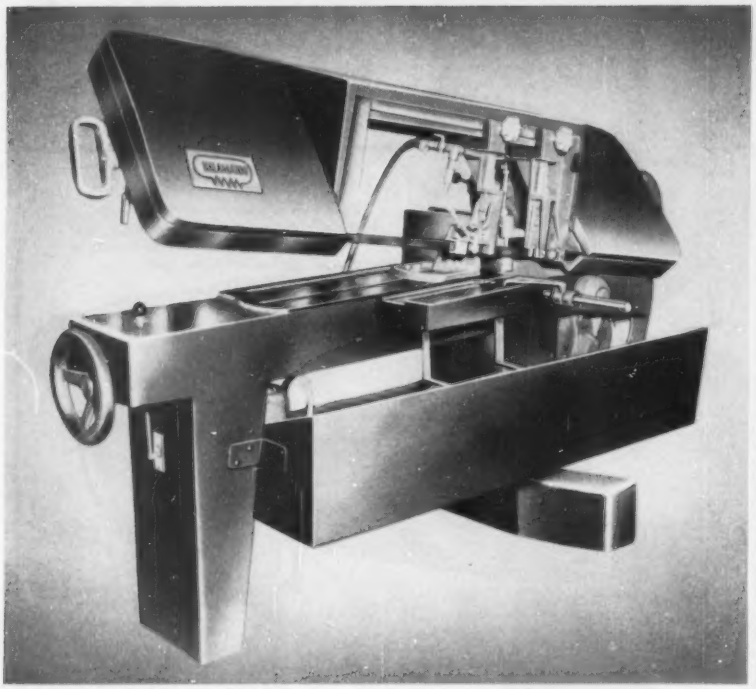
The Pioneers of Horizontal

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
505 ROOSEVELT RD., THREE RIVERS, MICHIGAN

FIRST 8-INCH METAL CUTTING SAW TO MEET TODAY'S NEEDS...



KALAMAZOO **Model 8C**

saves time three ways:

1. You save set-up time. Only a half-turn of Model 8C's quick acting vise instantly applies or releases pressure. And, the quickly-adjustable saw-guide arms have plastic coated tighteners for positive grip.
2. You save cutting time. Model 8C gives you a choice of four speeds for best cutting action. The ¾ HP motor and V-belt drive insure ample, positive power. Because he can clearly *see* the cutting action, the operator easily controls cutting accuracy.
3. You save down time. Operator can change blades in seconds, thanks to easy accessibility inherent in Model 8C's advanced design. And, the automatic shut-off switch eliminates need for operator attention as saw nears end of cut.

Get details, too, on the revolutionary KALAMATIC automatic Bar Feed Attachment for Kalamazoo Metal Cutting Band Saws.

You want the Kalamazoo Model 8C for your metal sawing work. You'll want its high-speed precision performance, never before available in an 8-inch metal cutting band saw. So, see the Kalamazoo Model 8C in action at your dealers . . . or, write today for descriptive literature. Also ask about the Kalamazoo Model 610 (capacity: 6" round, 10" flat) and the Kalamazoo Model 1220 (capacity: 12" round, 20" flat).

MACHINE TOOL DIV. *Kalamazoo* TANK and SILO CO.

135 HARRISON STREET • KALAMAZOO, MICHIGAN

ting the salesman roam around as he wishes is that it enables him to do some underhanded high-pressuring among the workers, thinking that they will be able to help him gain an advantage over his competitors. I should think that he would have enough sense not to knock his competitor's goods; even the dumbest of clucks will resent such an approach.

I had an experience some years ago that made me determined not to permit salesmen to wander around in my department. Several days following one of these visits to the shop, the superintendent came to me and told me the story of the salesman advising one of the men that he was using the wrong wheel. Well, one would think that I was responsible for him doing so, but there is a certain amount that a foreman can attend to; he can't cover all the ground all the time. While it wasn't a serious matter, the fact remains that it put me on the spot, and believe me I got hot under the collar. The salesman interfered with my work and had no business wandering around the shop; his place is with the foreman and then only at times when he is free to listen to his story. Often the higher-up will take delight in having something to gripe about and this was one of the times. Why should a salesman do such things to make the foreman's life harder than it is? It certainly places Ed in a poor light to have his men get up-to-date information from the salesman behind his back.

There are many ways of wrecking shop discipline; I don't blame Ed one bit for insisting that salesmen confine their activities to the foreman's office. This idea of wandering around the shop, handing out such things as cigarette lighters, cigars, or streamlined pencils, strikes me as savoring too much of carnival ballyhoo and does not lend dignity to his profession.

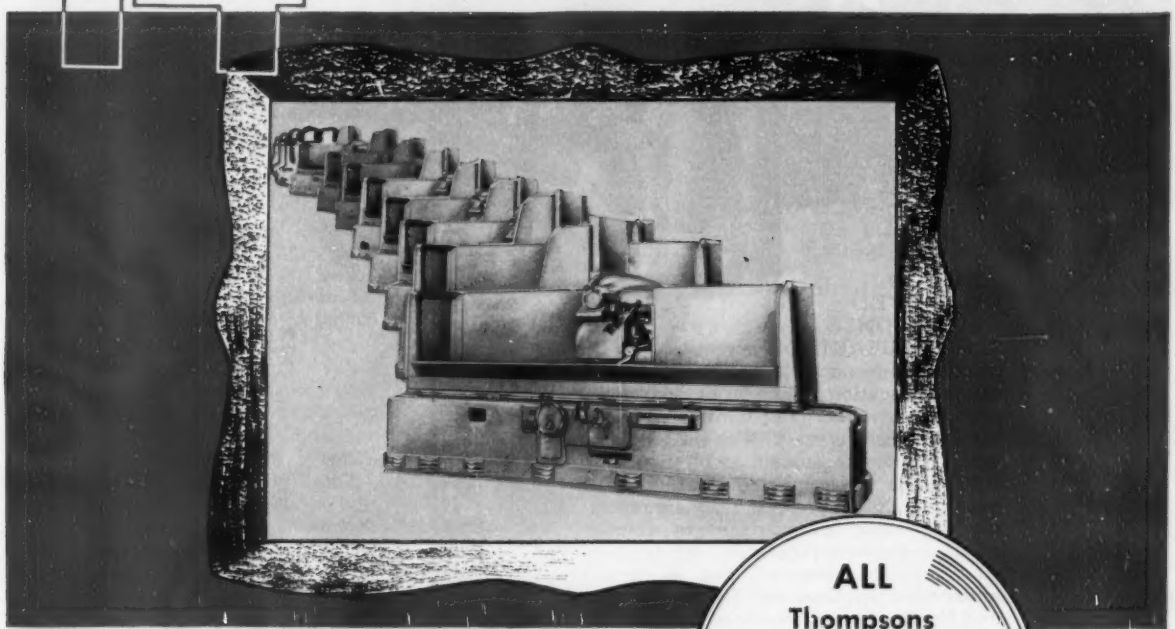
Undoubtedly the salesman does

"If her Tom's such a hotshot at the shop why do they call a repair man every time their washer breaks down . . . ?"

LOOK CLOSELY AT THIS PICTURE
OF GRINDER PRODUCTION AND SEE WHY...

14 is a lucky number

for a manufacturer requiring precision grinding



ALL Thompsons operated continuously with much LESS DOWNTIME

that's why

it will pay you to invest in

Thompson Grinders

After twelve years continuous manufacture of precision ground products, ten Thompson Surface Grinders proved so efficient and economical that this manufacturer ordered four more machines.

Thompson Grinders are available in a wide range of types and sizes from 6" x 18" to 72" x 384" to meet all production, special or tool room grinding requirements. The Thompson line includes machines from giant Hydrial Way Grinders to automatic Truform Jet Blade Contour Grinders, Dual Rotary Grinders and Broach Grinders.

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THE THOMPSON GRINDER COMPANY
Springfield, Ohio

Graphited
JOHNSON BEARINGS FOR MANY SPECIAL USES
JOHNSON GRAPHITED CAST BRONZE SLEEVE BEARINGS were developed primarily for applications where lubrication is difficult or likely to be neglected. Another important use is where the shaft speed is too slow or the temperature too low to sustain an oil film; also where high operating temperatures may burn out oils and greases. They are recommended where lubricants might damage goods or foods in process, where dripping oil cannot be tolerated, and in certain underwater applications. Johnson Graphited Bearings are available in three types: with serrated grooves, with graphite plugs, and with graphite-filled oil grooves. The serrated type is a stock item in over 200 sizes, available through Johnson Distributors. Write for full information.
JOHNSON BRONZE COMPANY, 515 South Mill Street, New Castle, Pa.
JOHNSON JB BEARINGS
Sleeve Type
OTHER JOHNSON BEARING TYPES: General Purpose (GP) • Electric Motor (EM) • Self-lubricating Powder Metallurgy • Universal Bronze Bars • Babbitt
SLEEVE BEARING HEADQUARTERS

accumulate some valuable information in his travels around the various shops, but I see no reason why he should use that knowledge for building up false reasons why his grinding wheels are the best on the market. Besides, any wide-awake foreman will look upon this wandering Willie as a pretty good leak for methods that should remain where they are.

Rex Warren
Waterloo, Iowa

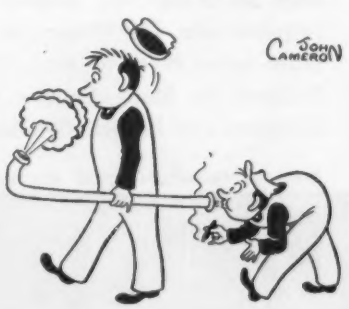
THE SUPER SALESMAN or personality boy loves to get in the plant. He likes to get into the shop and talk to the boys. He likes to dramatize his product. He passes out cigars and other gifts. This is what I call outside influence affecting the worker's mind.

It is quite true that an experienced salesman can be of great help in the average shop. He is quite willing to talk about other plants and their methods; he has a good knowledge of how other shops operate. He helps in any way he can in order to get you to use his product. Many shops do not let the salesmen past the office.

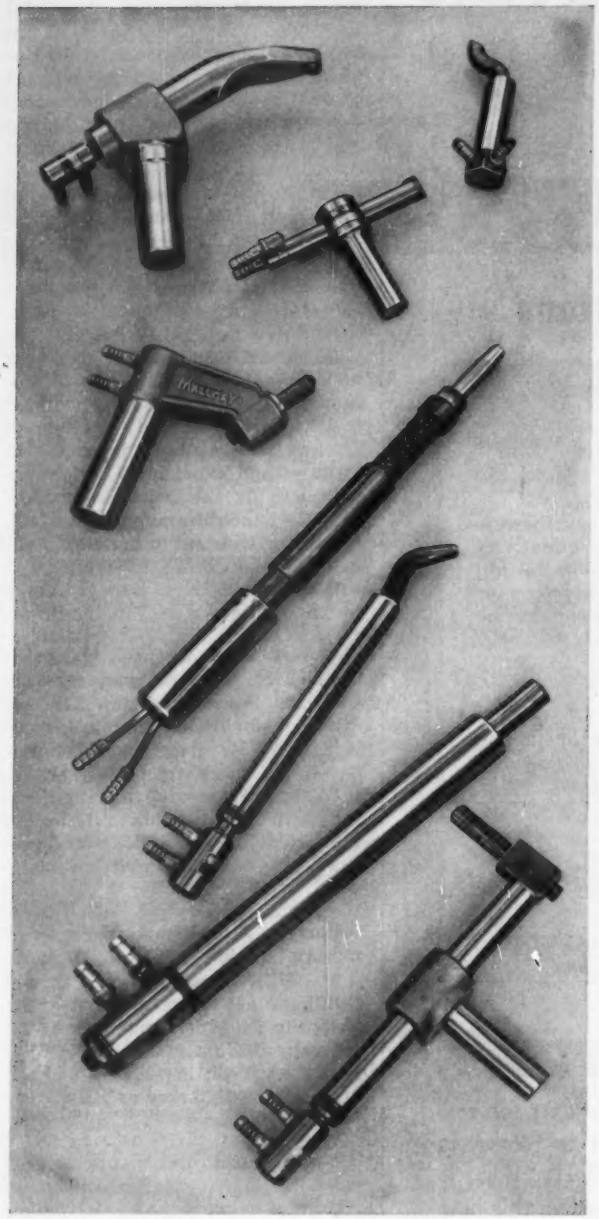
I do not believe they should be barred from the shop, but I do think they should be prevented from roaming the shop at will. If allowed to, they can do great harm. They give the workers cigars and other gifts, and as a result, the workers are inclined to favor his product.

Those plants that do not have a rule covering salesmen should make one. The salesman should not be allowed in the shop to pal around with the workers; he should only be allowed in the shop in the presence of foremen or supervisor. It would be a simple matter to tell the salesman it is a company policy or rule; in this way it would not cause bad feeling. When the sales people get to know the rules of the various shops, they usually abide by them. After all, the salesmen are out to get orders in every way they can. They can—and do—great harm by influencing the worker's mind in favor of their product.

A E Salmons
Philadelphia, Pa



No Job is a "Special"...



with Mallory Resistance Welding Holders and Electrodes

Welding pressures from under 100 pounds to over 6000 pounds can be handled by standard Mallory holders and electrodes . . . available from stock.

In addition, holders and electrodes are available in such a wide variety of shapes and designs that standard units can be combined in an almost infinite number of combinations. Practically any resistance welding job can be done without the cost or delay of special designs.

The Mallory line is the result of over 25 years of experience in the development of special alloys and a complete range of designs. Write us, or ask your distributor, for the new Mallory Catalog. See for yourself the complete line of holders, electrodes, rods & bars, dies, castings, forgings, and accessories that are on the shelf for immediate delivery.

Expect more...
Get more from
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For Unexpected Profits
IN YOUR SHOP

ask yourself these questions

- Could you increase your productivity and profits by *fast rearrangement of machines* to meet new production needs, with very little "down time"?
- Could you benefit by *speed in leveling certain machines?*
- In precision machining operations, such as grinding, do you ever find that rejects are *traceable to vibration?*
- Would you like to *forget about lagging machines* to the floor to keep them from walking?
- Would your worker productivity increase if you could *reduce plant noise?*

. . . then let us do something about the answers

The NEW Leveling Barrymount *can make profits for you out of problems you may have thought couldn't be solved.* It represents a wholly new idea in mounting machinery. What it can mean to you *in immediate profits* is described in this new bulletin.

Write TODAY for your free copy of "LOOK — NO LAGGING!"

THE **BARRY** CORP.

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Atlanta Baltimore Chicago Cleveland Dallas Dayton Detroit Los Angeles Minneapolis New York Philadelphia Phoenix Rochester St. Louis San Francisco Seattle Toronto Washington

NAMES in the NEWS

Frank S Wartman, chief of the Bureau of Mines' Titanium Research station at Boulder City, Nev, has been given the Department of Interior's highest honor, the Distinguished Service Award, for his part in developing the magnesium reduction process for producing titanium. Mr Wartman joined the Bureau in 1923; he began investigating the technology of titanium in 1938 to determine its metallurgical possibilities. He later directed the engineering development on laboratory and pilot-plant scales necessary to place the process on a practical basis.

Richard E Miller, general manager of Rockwell Manufacturing Co's Columbus plant, has been appointed to the newly-created position of product sales manager in charge of all saws and expendable tools manufactured by the Delta Power Tool Div. He joined the company in 1947, serving as assistant to the vice president, assistant general manager, and sales manager. Mr Miller will make his headquarters at Pittsburgh.

W H C Berg has been appointed director of standards and research for the Hanson-Whitney Div of Whitney Chain Co. Prior to his appointment Mr Berg had been engaged for more than 30 years in metallurgical research and engineering development work relating to machine tools, cutting tools, and mechanical power transmission products.

Charles E Heitman, manager of the Automotive Div of A O Smith Corp, Milwaukee, has been named to fill the newly-created post of assistant to the general manager of the company. He has managed the division since 1946; in 1951 he took on an interim assignment as Milwaukee Works manager.

Carl F Enroth has been appointed assistant to the vice president in charge of sales, Kearney & Trecker Corp, Milwaukee. Formerly works manager, Mr Enroth joined the firm in 1939; he was previously associated with the Pratt & Whitney division of United Aircraft.

Clarence E Killebrew has been named vice president of Clark Equipment Co, Buchanan, Mich. Formerly manager for marketing and sales in the company's Construction Machinery Div, Mr Killebrew will be responsible for all products sold under the "Michigan" trade name.

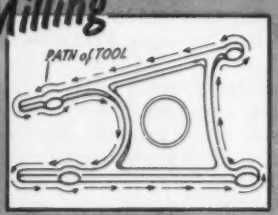
NEW

three-dimensional tracer-controlled high-precision

TURCHAN HYDRO-ROUTER

Routing

Milling



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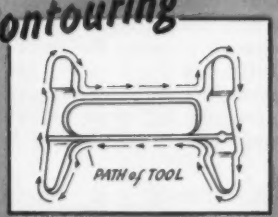
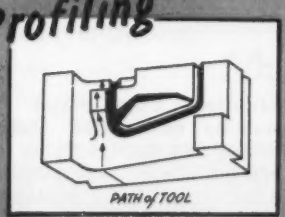
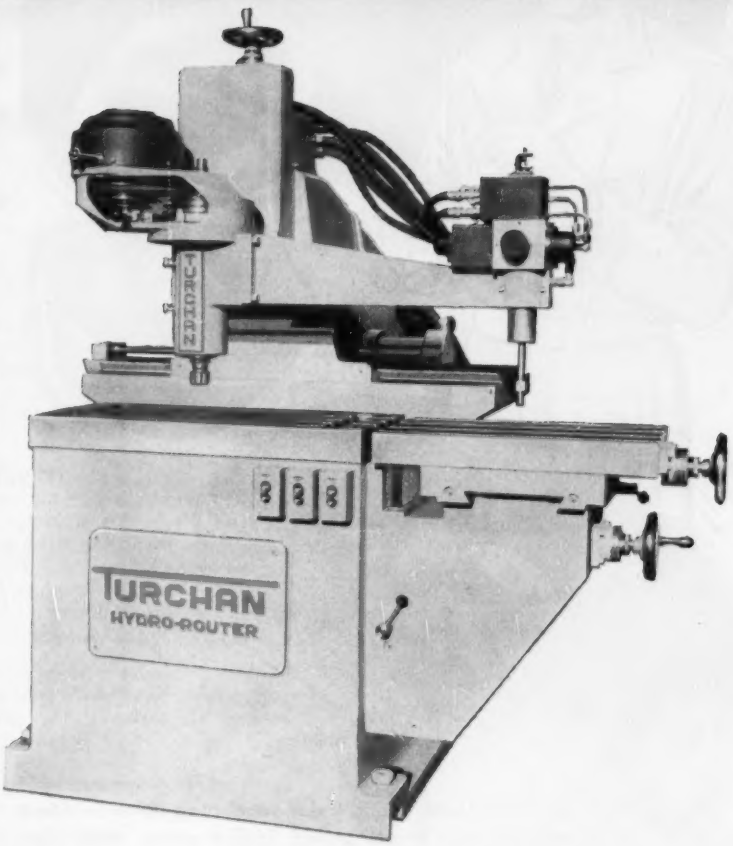


Profiling





Greater sensitivity, accuracy and increased duplicating speed result in hours of costly time saved on irregular forms and parts with Turchan's new Hydro-Router. Controls are grouped within easy reach of operator; virtually eliminating fatigue. Infinitely variable three-dimensional tracer control of vertical, cross and longitudinal spindle movements produces a superior finish at extreme accuracy of duplication. Turchan Hydro-Routers are available in many sizes; each with a wide range of speeds and feeds for carbide work and all metals. Write for full information.

See the "Turchan Story" in Sweet's '54 File

. . . in the Machine Tool Catalog file, or
write Turchan direct for your individual copy.

Turchan FOLLOWER MACHINE COMPANY

Machine Tools Division, 8259 Livernois Avenue, Detroit 4, Michigan

For 20 years, designers and builders of automatic hydraulic tracer-controlled equipment for standard machine tools and special machines

In a four month period under actual competitive conditions one Diamond Wheel ground 36,976 pieces, while eight silicon carbide wheels ground a total 16,023 pieces.

RESULT— 1. Less cost per piece 2. Greater Production 3. Less down time.

See for yourself how

SECOMET DIAMOND WHEELS

can provide you with these plus values

Send for informative catalog #54 or contact us direct for information and assistance.

SUPER MATERIAN IGNIS TRIUMPHANS

J. K. SMIT & SONS, INC.

MURRAY HILL, N. J.

Ralph F Anderson has been named president of Anderson Bros Manufacturing Co, Rockford, Ill. He succeeds **Swan F Anderson,** head of the company since 1916, and now appointed chairman of the board. The new president, formerly secretary-treasurer, will retain his post as treasurer.

Fred W Gottschling has been appointed director of engineering for Greer Hydraulics, Brooklyn, NY. Mr Gottschling joined the company shortly after it was founded eleven years ago, and has held various executive positions in the engineering department since then.

William Littlewood, vice president, engineering, American Airlines, has been named president of the Society of Automotive Engineers. He succeeds **Robert Cass,** White Motor Co, Cleveland, Ohio.

NEW BOOKS

SPI DIRECTORY — *Published by the Society of the Plastics Industry, Inc, 67 W 44th Street, New York, N Y. 299 pages. Free to members.*

Directories need not be clumsy, vague, and unreadable, as this one proves. It is a generally excellent society directory covering bylaws, committees and divisions, members (both individual and company), processing companies, plastics products and supplies, machinery, and mold makers. The listings are unusually concise and simple, and show good organization. Among the most useful of listings in the directory are those of member companies by geographical location and stock materials by generic name and physical form.

•

MANUFACTURING AND MECHANICAL ENGINEERING IN SOVIET UNION — *Compiled by Gisella R Lachman. Published by The Library of Congress, Reference Department, Washington, DC. 234 pages. Price $1.60.*

Publications from Soviet Russia containing information about engineering and manufacturing in that country are listed under subject and also by author. If the publication is known to be located in a library in the US or Canada, that is also indicated. The list includes mainly work from the last ten years, in addition to a few important articles of earlier vintage. Titles are in English.

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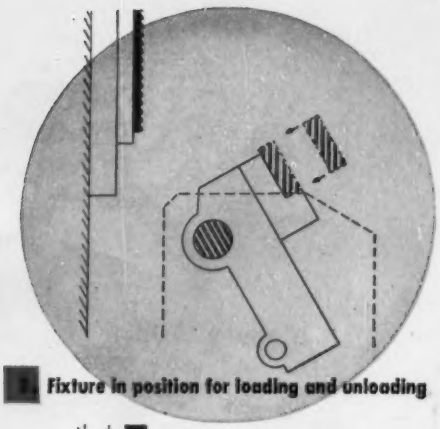
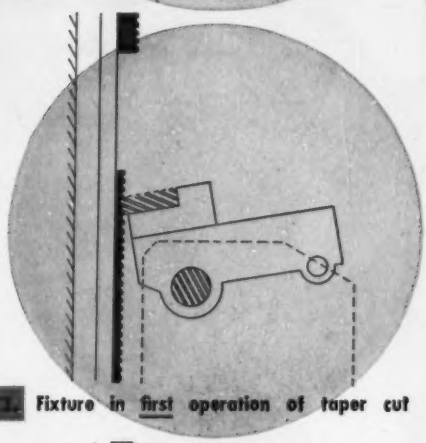
the LAPOINTE Mid-cycle Retilting AUTOMATIC FIXTURE permits the BROACHING of NON-PARALLEL CONTOURS in a single pass

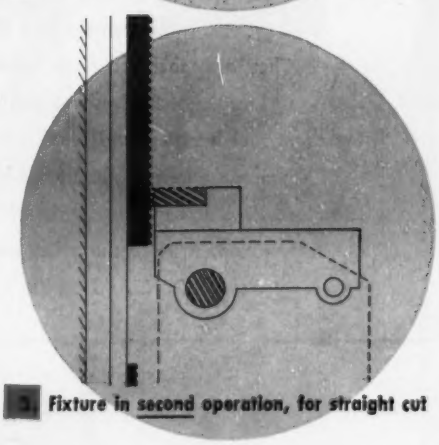
without removing the part from the fixture!



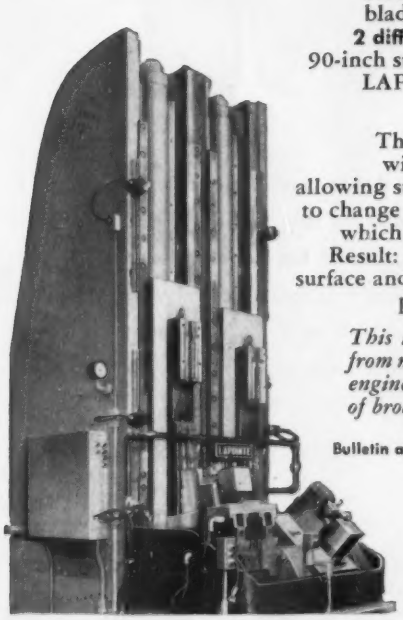
1. Fixture in position for loading and unloading



2. Fixture in first operation of taper cut



3. Fixture in second operation, for straight cut



15-TON 90" DRV LAPOINTE BROACHING MACHINE

Necks of stainless steel turbine blades are finished-broached at **2 different angles** on this 15-ton 90-inch stroke Double Ram Vertical LAPOINTE Surface Broaching Machine.

The broach is in two sections with a "dwell" between, thus allowing sufficient time for the fixture to change position for the second cut which occurs **on the same stroke.** Result: removal of .340" stock per surface and a production of 240 parts per hour, at 80% efficiency.

This is another example resulting from more than 50 years of Lapointe engineering . . . entirely in the field of broaching.

Bulletin available on request. Ask for DRV-2

This mid-cycle retilting automatic fixture is synchronized with full electrical interlocks.

THE LAPOINTE MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.
In England: Watford, Hertfordshire

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

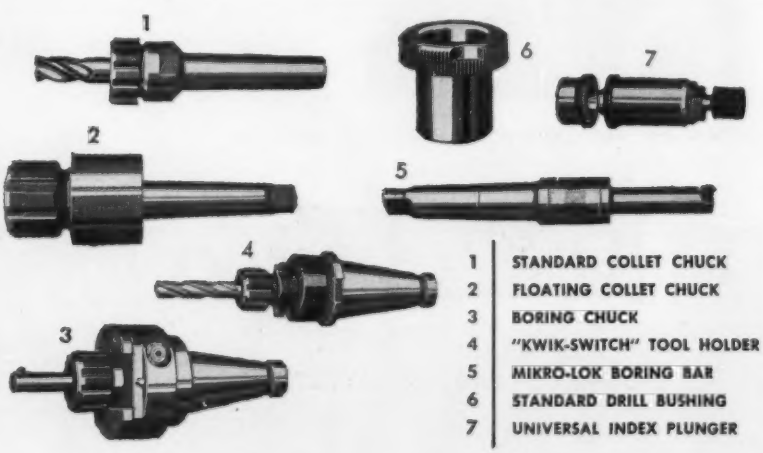
MEET THE CHAMP!

UNIVERSAL DRILL BUSHINGS BEAT ALL RECORDS FOR LONG LIFE AND ACCURACY

The extremely long life of Universal Drill Bushings is due to several factors. They are machined from finest quality steel. Their superhoned bores help to reduce both wear of the bushing and wear of the tools. Blended radius on the top inside diameter helps prevent tool hang-up and breakage. 100% concentricity and hardness tests insure accuracy and uniform quality. Knurled heads provide a quick, sure grip. Available in a complete range of standard sizes and lengths. Orders for special dimensions will receive prompt attention. For complete information, write to the office nearest you—Universal Engineering Sales Co., 1060 Broad St., Newark 2, N. J.; 5035 Sixth Ave., Kenosha, Wis.—or our home office.

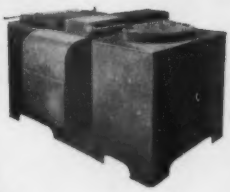
179

UNIVERSAL ENGINEERING COMPANY
FRANKENMUTH 1
MICHIGAN

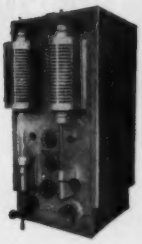


1	STANDARD COLLET CHUCK
2	FLOATING COLLET CHUCK
3	BORING CHUCK
4	"KWIK-SWITCH" TOOL HOLDER
5	MIKRO-LOK BORING BAR
6	STANDARD DRILL BUSHING
7	UNIVERSAL INDEX PLUNGER

..melting furnaces



..laboratory equipment



..blowers

Heat Treating Furnaces...Yes!
and *LINDBERG* also builds..

..hydraulic cylinders
..air cylinders

..transformers

..high frequency induction units

In addition to heat treating furnaces, Lindberg designs and builds a broad and varied line of related products . . from air cylinders to high frequency induction units.

The story of the complete line of Lindberg products is told in a newly published bulletin. Ask your local Lindberg Man for a copy (#250), or write Lindberg Engineering Company, 2450 West Hubbard St., Chicago, Illinois

LINDBERG FURNACES

NEMA-rated at 200 amps.

—but pulls 300 amps.!

Runs all day on one tank of gas!

New P&H WN-250 Engine-Driven

Here you get everything you've ever wanted in an engine-driven welder — including features you don't get from any other.

Take a quick look at some of the WN-250 advantages that help you keep step with demanding production schedules; help you cut costs:

(1) The P&H WN-250 has more capacity than other welders with the same rating.

(2) It has a full 20-gallon gas tank.

(3) It gives you the latest-type P&H welding generator, powered by a direct-connected gasoline engine. It's a four-cylinder, 180GLU Waukesha, water-cooled and built for heavy duty. And we really mean *heavy* duty — it's not an automotive light-weight. Available with electric starter.

(4) The WN-250 is equipped with a P&H idling device that establishes the rated speed of 1800 rpm as soon as the arc is struck. This speed is maintained for a set period after the arc is broken.

(5) It has P&H's famous Dial-lectric Control. An easy turn of a radio-type knob provides stepless heat adjustment over the entire high or low range.

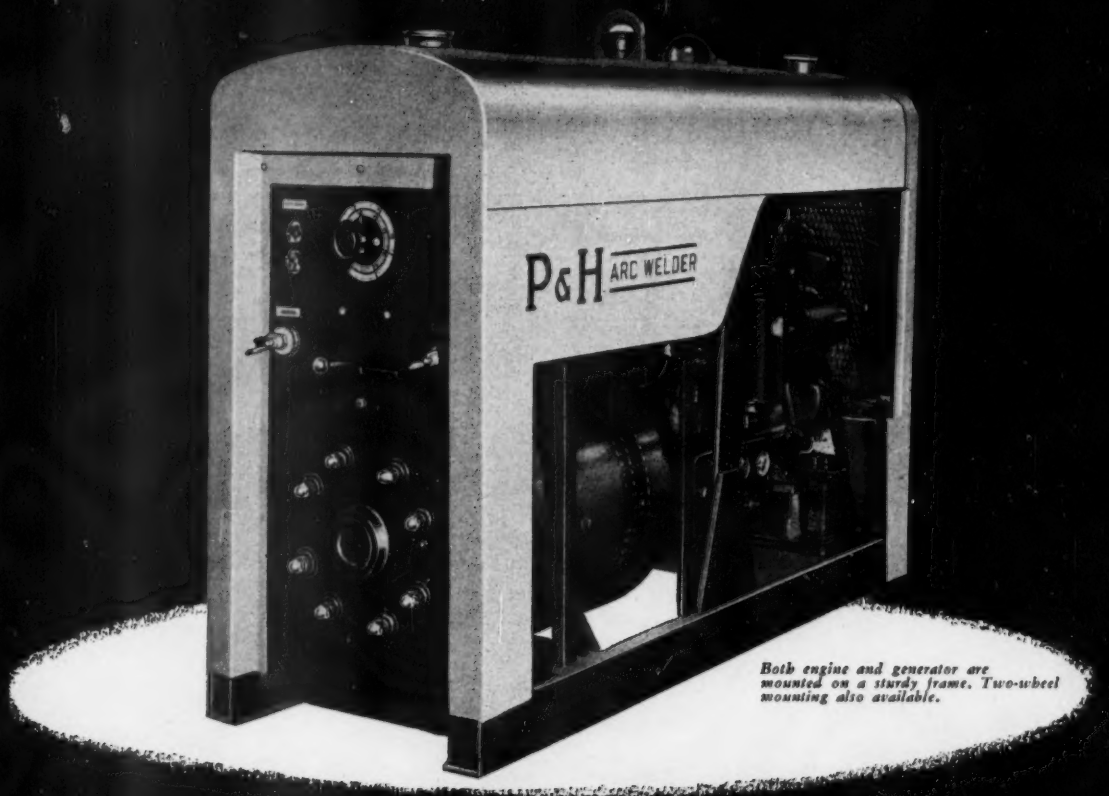
(6) It has pre-lubricated bearings, to reduce the need for servicing and insure longer life.

(7) It has an auxiliary AC power supply (1KVA) that permits floodlighting and running power tools, while welding.

There are other reasons why you're money ahead with a P&H WN-250. Ask your P&H representative or distributor for all the facts. Or, write for bulletin.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4514 West National Avenue • MILWAUKEE 46, WIS.

the P&H *Line*



Both engine and generator are mounted on a sturdy frame. Two-wheel mounting also available.

Arc Welder

America's most complete line of Arc-welding equipment and electrodes

Continuous 8-hour welding test demonstrates the extra stamina of the P & H WN-250

You can't beat welding performance like this: In a recent test, the P&H WN-250 operated continuously for 8 hours on a 70% duty cycle.

A 5/32" electrode was used with 300 feet of cable. There were 250 amps. at the electrode. So that the test would be continuous, three welding operators were used. When one got tired, another took over. All used the drag technique with a 6010 rod — which is as close to a short circuit as you can get.

At the end of 8 hours, the P&H generator was still cool. And the WN-250 was still rarin' to go — the weldors were worn out, but not the machine.

P&H AC WELDER

A full range of sizes up to 625 amps. (NEMA-rated). All are connectable to 220 or 440 volts. Dial-lectric Instantaneous Remote Control is fingertip control — gives you any heat you want—right at the work.

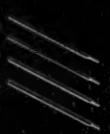
P&H DC RECTIFIER WELDER

Three sizes — 200, 300, and 500 amps. (NEMA-rated). No moving coils — no bearings, brushes, commutator, brush riggings, etc. Dial-lectric Control gives you finger-tip heat-control at the work.

P&H POSITIONERS

One finger is enough to position heavy weldments for economical downhand welding. Capacities from 2500 to 36,000 lbs. — remote control and hand operated models.

P&H ELECTRODES



A type and size for every job — to give you cleaner, sounder welds at lower cost on mild steel, cast iron, "hard-to-weld" steels, stainless steels, or hard surfacing.

P&H Welding equipment is manufactured and sold in Canada by

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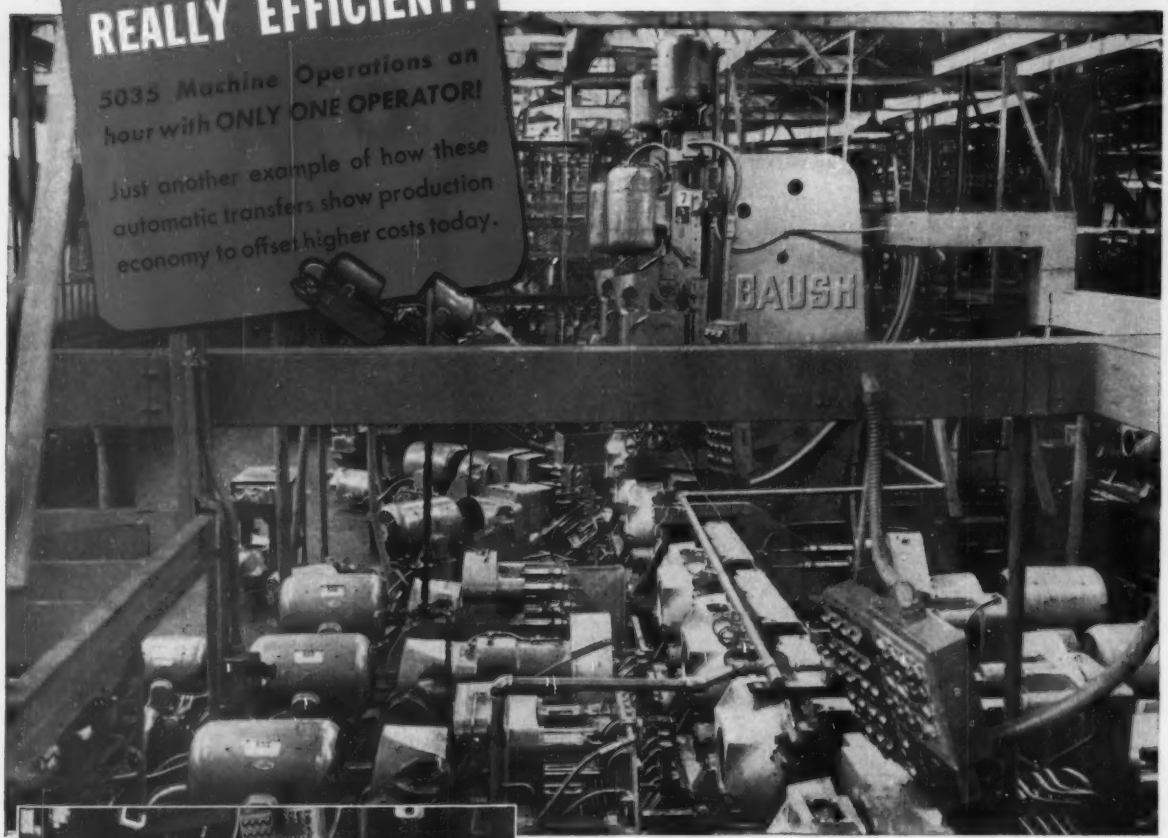
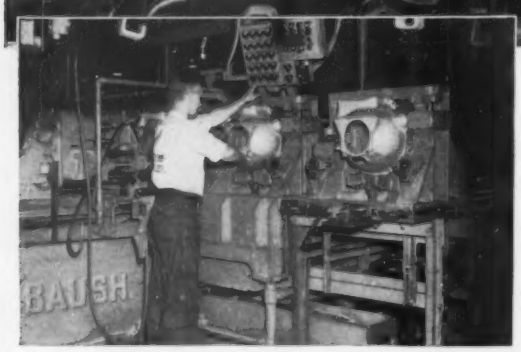
Baush Transfers are REALLY EFFICIENT!

5035 Machine Operations an hour with ONLY ONE OPERATOR!

Just another example of how these automatic transfers show production economy to offset higher costs today.

Looking down on Baush 9-Station Transfer Lineup.





Closeup of Torque Convertor Housings being loaded onto holding pallets at start of conveyor.

EQUIPMENT:

Transfer illustrated is a BAUSH 9-STATION LINEUP having 1 loading, 7 working, and one idle station. Transfer consists of 13 mechanical leadscrew units equipped with hydraulic locating and clamping features. Panel-type conveyor has 12 loading pallets to hold working part.

OPERATIONS:

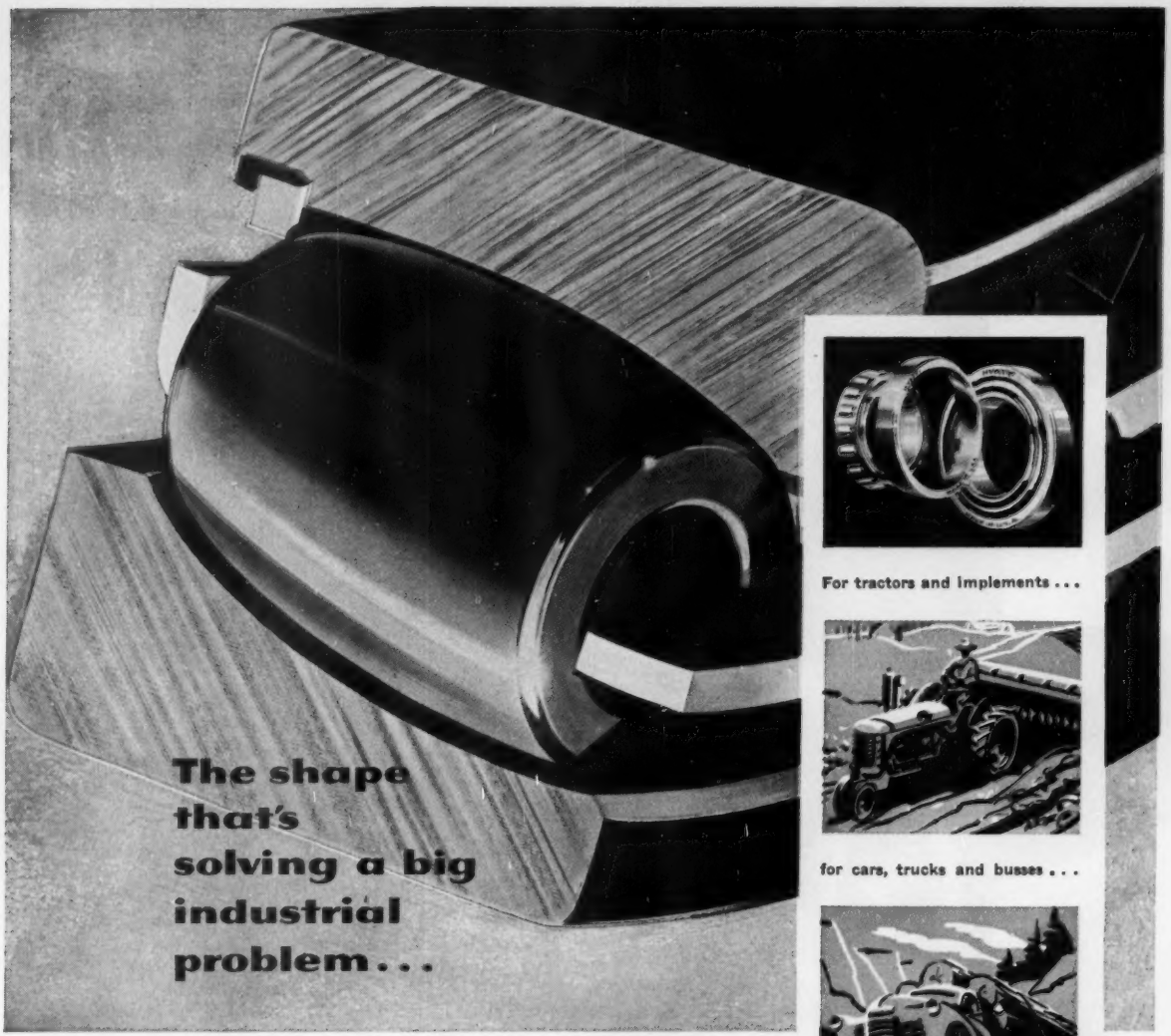
Designed and built to J.I.C. Standards this transfer lineup performs 53 operations on Torque Convertor Housings.

All holes in clutch housings are drilled, rough and semi-finish bored, reamed and finish reamed, counter-sunk, chamfered and tapped, while transmission pilot hole is rough bored.

PRODUCTION:

Capacity is 95 Torque Convertor Housings per hour at 80% efficiency.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

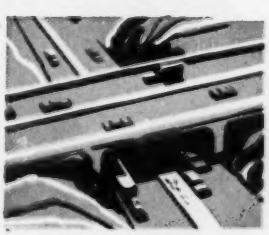


For tractors and implements . . .

for cars, trucks and busses . . .

NEW HYATT BARREL BEARING!

You're looking at a cross section of industry's newest find—*the bearing that's built with barrel-shaped rollers!* Developed by Hyatt, the Barrel Bearing is of true dual-purpose design—it takes load from any direction. But more than that, the Barrel Bearing is self-aligning—and misalignment of supporting parts cannot cause excessive wear, as it does with ordinary bearings. Now in volume production, this new bearing is in the newest trucks and busses, in farm, textile and construction equipment, and in many types of oil field machinery. In fact, if you own a new car there's a good chance that Barrel Bearings are in the wheels and differential.



for construction equipment and many types of new machinery.

HYATT

STRAIGHT ▷ BARREL ▷ TAPER ▷

ROLLER BEARINGS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, N. J.

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These are a few of the valuable services that your Simonds Industrial Distributor offers you . . . quick deliveries, ample stocks, simplified paperwork, "field service" in hunting down new developments, as well as help on engineering problems. And out of his wide experience he is able to help you get top performance out of the best cutting tools made for metal and wood . . . *the Simonds red-trademarked line of 100% quality-controlled products.* Call him today. He'll come at the drop of a hat . . . *any* hat you want him to wear!

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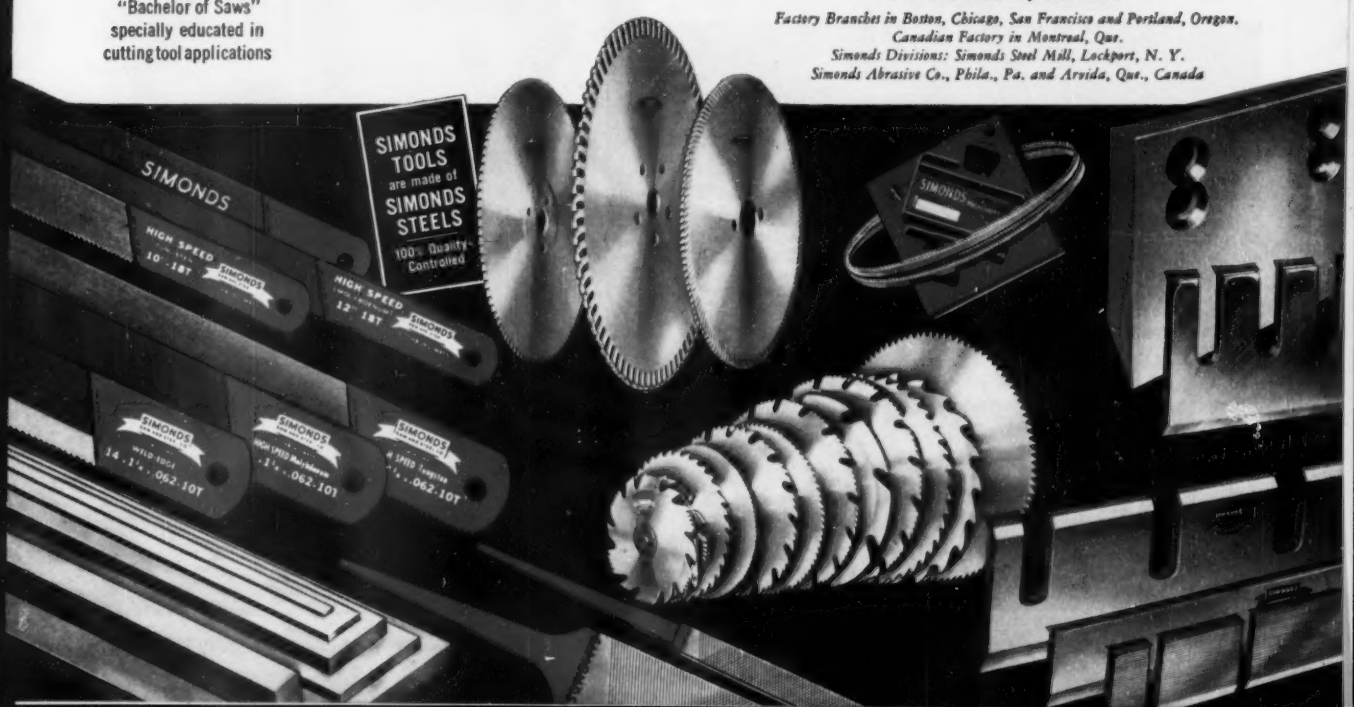
Canadian Factory in Montreal, Que.
Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

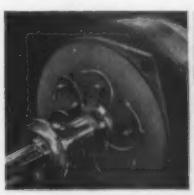


DURABILITY

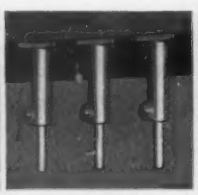
...you get it with a Minster Press

■When you see Minster on the nameplate you are looking at a press with an unusual reputation for long time trouble free operation. Here is machine tool durability at its best . . . here is the extra stamina so necessary today in modern power press operation.

Do you have a replacement program for old, obsolete equipment in your shop? Are you undertaking an expansion? If presses are involved, consider the added values you get with Minster presses . . . values good not only today but for many productive years to come.

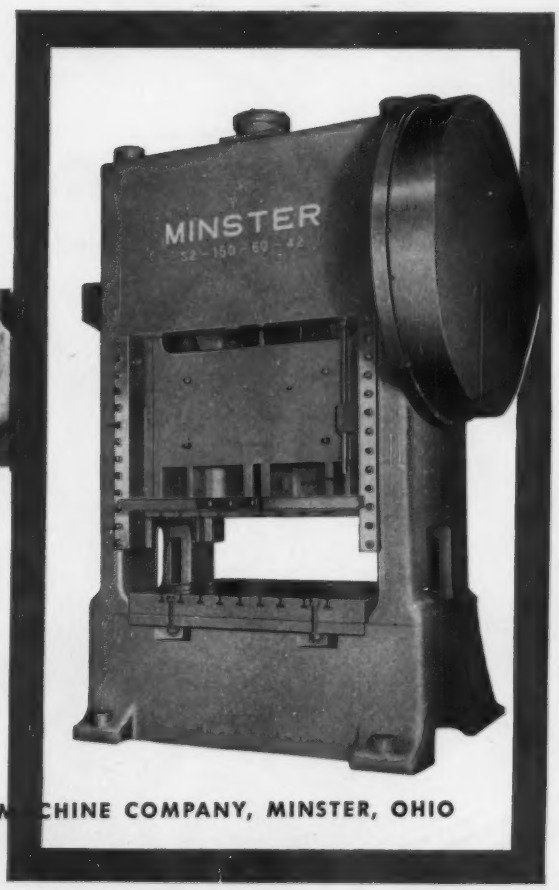


Minster's remarkable air operated combination friction clutch and brake. 10, 12, 15 years of service with no repairs is commonplace.



Safer, faster adjusting knockout bars, a typical example of Minster's attention to details. Slip without damage if clearance is improperly set.

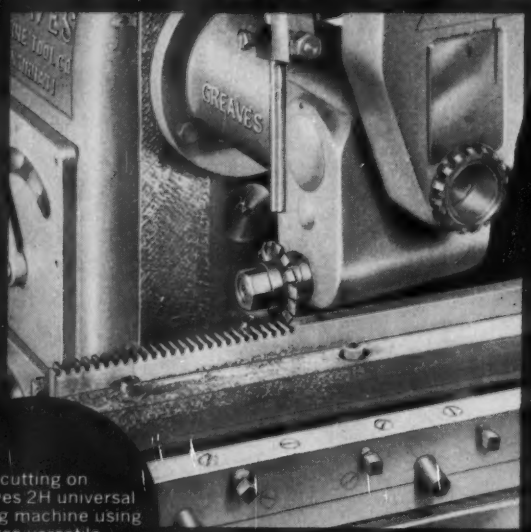
Minster presses are a long time investment, being built with extreme care. Precision machining of gibbing assures accurate slide alignment.



MINSTER
FIRST IN PRESS DESIGN

THE MINSTER MACHINE COMPANY, MINSTER, OHIO

comparison proves GREAVES costs less performs with the best



Rack cutting on Greaves 2H universal milling machine using Greaves versatile rack cutting attachment

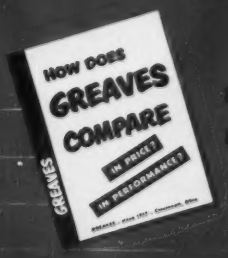
Greaves 2H Universal Milling Machine

Before you buy . . . get the facts! When it comes to speeds, feeds, power and capacity, the Greaves 2H plain and universal milling machines are right around the top. But when you're talking about original purchase price and cost of operation and maintenance, Greaves is lowest!

Make your own comparison! Don't just take our word for it . . . send today for chart comparing the eight leading milling machines. See for yourself why Greaves is your best buy.

GREAVES MACHINE TOOL CO.

CINCINNATI 2, OHIO, U. S. A. ESTABLISHED 1917 DIV. J. A. FAY & EGAN CO.



Please send me chart comparing the 8 leading U.S. milling machines for price, capacity, power and other significant specifications.

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NOW- RB&W nut

IN THE LARGEST as well as the smallest sizes, RB&W turns out nuts in tremendous volume every day.

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109 YEARS MAKING STRONG

THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales offices at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

makers are closer to your assembly line

If it's your job to buy nuts, and be concerned about delivery, you'll be glad to know that all four RB&W plants across the country are now manufacturing and stocking the famous RB&W nuts in large quantities.

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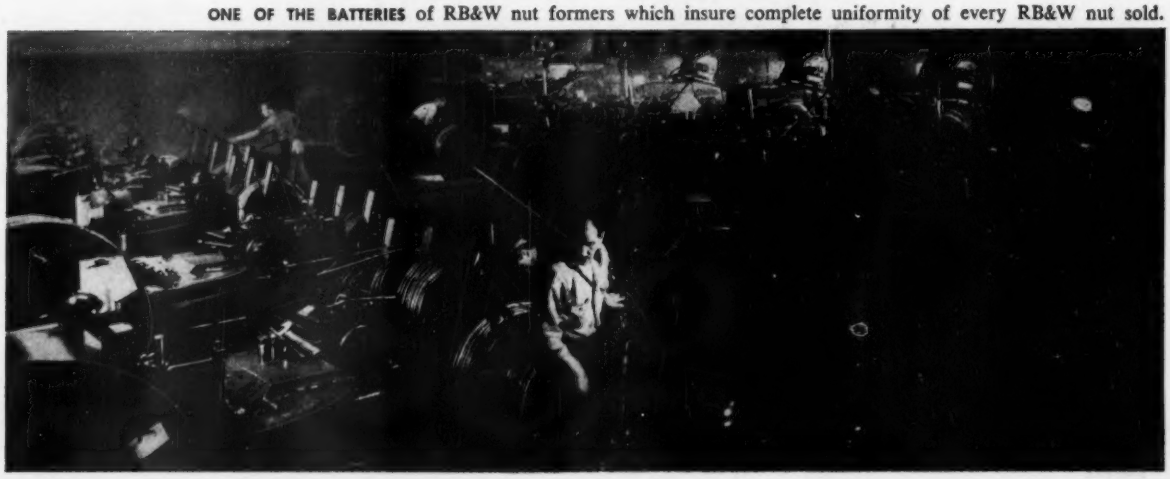
For generations RB&W, recognized as the largest manufacturer of nuts, has pioneered in the development and manufacture of cold-formed nuts. Since 1946, RB&W has invested millions of dollars in new machinery to turn out high-quality fasteners — more than three million has been spent on nut-making facilities alone. This equipment, plus the unmatched craftsmanship of four generations of RB&W men and women, explains why RB&W continues to lead the field in the production of top-quality nuts.

3.41

ONE OF THE BATTERIES of RB&W nut formers which insure complete uniformity of every RB&W nut sold.



What do *you* look for in a Tap, Mr. Johnson?

That will be "*performance-ability*" . . . something that you cannot see at first glance.

This has been built into the tap through proper selection and heat treating of the tap material, and the precision processes of machining the tap . . . processes that challenge the statement so often heard, "taps are all alike." That's why it pays to specify —

Hanson-Whitney . . .

The Hanson Process is the original method of *finishing after hardening*. Through this process, Hanson-Whitney has for 34 years produced a quality line of finished precision taps to the complete satisfaction of our customers. We have never manufactured cut thread or unfinished taps in our years of serving the metalworking industry. This is our assurance to you of the highest quality of precision threads and accurate finish throughout.

Yes, Mr. Johnson, you're bound to say that Hanson-Whitney Taps give you dependable day-in, day-out production performance . . . performance that is proven on your cost sheets. Of course, the right tap for the specific job is essential.

Ask the Hanson-Whitney representative for his recommendations.

the **HANSON**
Threading Processes
Offer Complete
Coordinated
Responsibility
for
The Machine Tools
The Cutting Tools
The Measuring Gages

HANSON-WHITNEY DIVISION of the WHITNEY CHAIN CO.

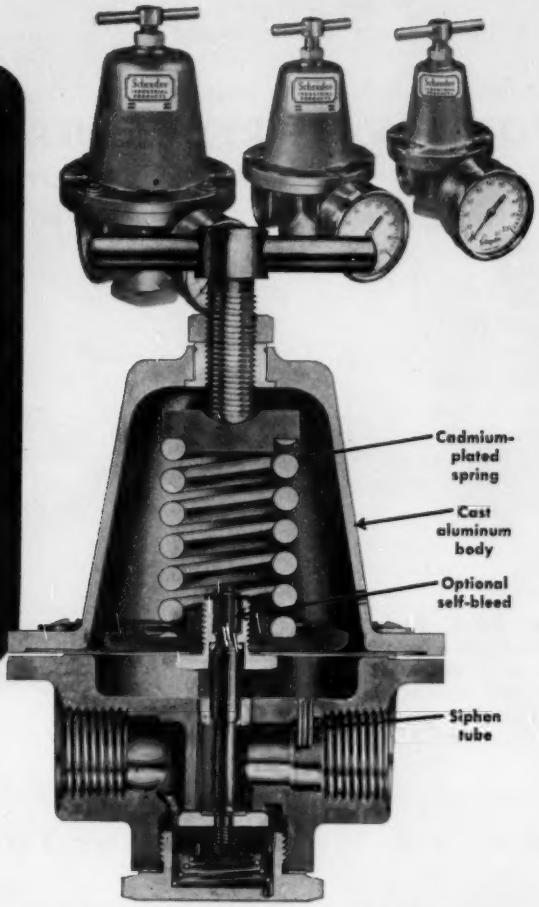
160 Bartholomew Avenue, Hartford, Connecticut, U. S. A.

Our Mr. Johnson is a composite character typical of the thousands of experienced practical machinists throughout the country. You, too, have a Mr. Johnson in your shop . . . ask him what he thinks about Hanson-Whitney Taps.

3HW53A

The New Schrader Air Pressure Regulator

NOW... get
–maximum capacity
–fastest response
–minimum pressure drop



Large ports and straight-through design of these new Schrader Regulators give you maximum capacity with minimum pressure drop—and, at the same time, response that is almost immediate to changing demands.

Available in five sizes—¼, ⅜, ½, ¾, and 1 N.P.T., with and without gauge. Its normal range is 5-150 psi. A self-bleed feature for accurate pressure control is available if desired.

The lightweight aluminum body—heat-treated for strength—specially treated for corrosion resistance—means this new Schrader product can be mounted anywhere without special supports. Interior construction is of corrosion-resistant materials throughout. The diaphragm is a special material, noted for its strength and long life. All parts are replaceable, and service can be performed without special tools or removing the regulator from the line.

The regulator can be installed for flow from right to left ... left to right ... or vertically in either direction. It may be mounted right side up or inverted. The pressure gauge may be installed front or rear.

Once again, with these quick acting, high capacity regulators, Schrader demonstrates its leadership in compressed air equipment. Write today—or fill out the coupon—for more information on the new Schrader Regulators, or *any* air control devices.

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Please send me details on the new Schrader Air Pressure Regulator.

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Company_____

Address_____

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• These pages can only hint at the variety and scope of machines now being made available to you through Motch & Merryweather engineering. Each machine has been designed only because it performs a present operation better or unitizes operations to advantage. To further cost-saving and automation in your production program, call on Motch & Merryweather's 50-year background.

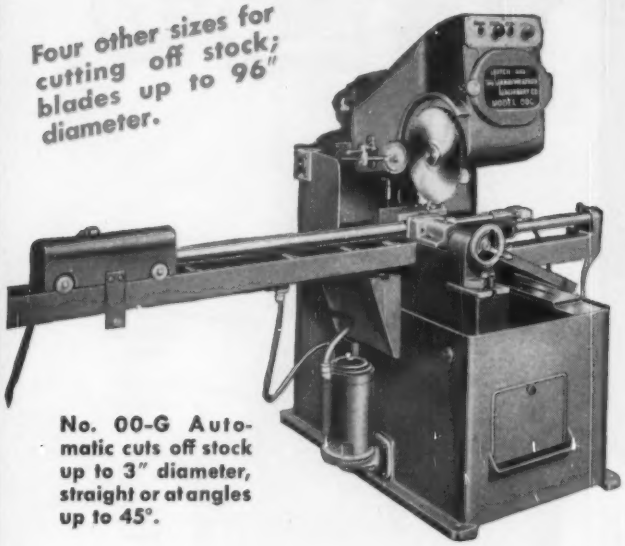
USE AN EXPERIENCE REACHING BACK 50 YEARS IN THE MANUFACTURE AND SALE OF MACHINE TOOLS

MOTCH & MERRYWEATHER Circular Sawing Machines

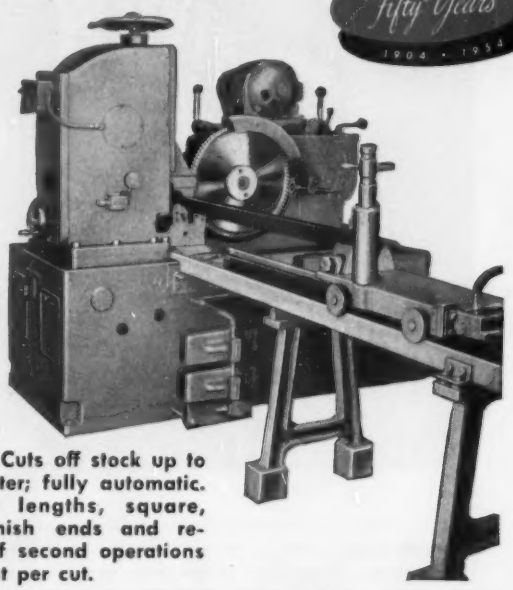
to cut off every size and shape of stock, ferrous or non-ferrous.

Fifty Years 1904 • 1954

Four other sizes for cutting off stock; blades up to 96" diameter.



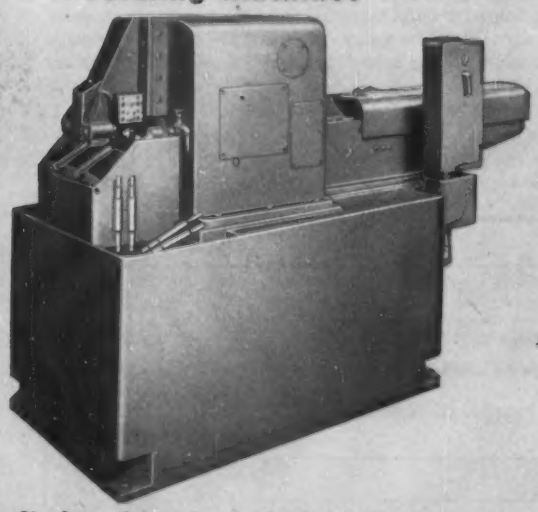
No. 00-G Automatic cuts off stock up to 3" diameter, straight or at angles up to 45°.



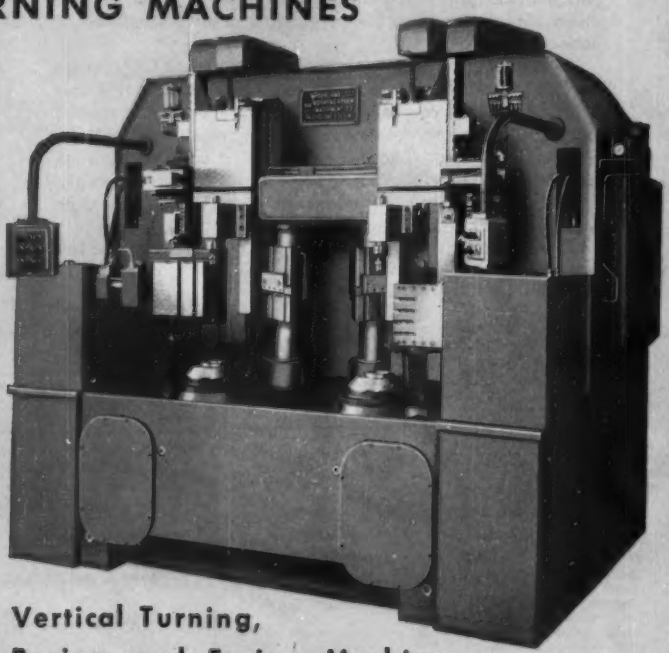
No. 2-A. Cuts off stock up to 6" diameter; fully automatic. Accurate lengths, square, milled finish ends and reduction of second operations lower cost per cut.

Motch & Merryweather TURNING MACHINES

Cam Automatic Forming Machines



Single- and double-spindle models. Hopper loading or bar feeds. All movements actuated by single cam shaft.

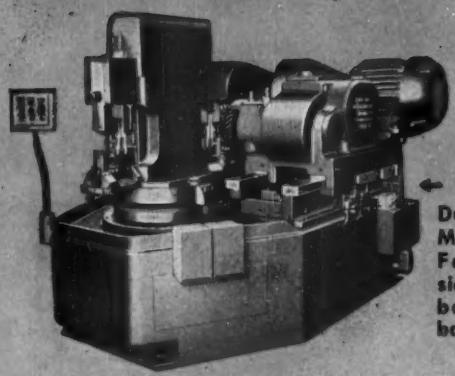


Vertical Turning, Boring and Facing Machines

Single- or double-spindle. Multiple tool blocks hydraulically fed with automatic sequence for maximum metal removal.

FOR PROFITABLE PRODUCTION THROUGH DESIGN

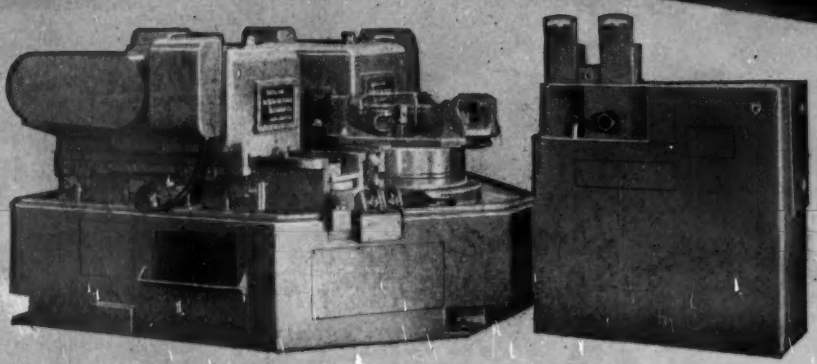
Heavy Duty Production Milling Machines



Duplex Production Milling Machine. Face mills both sides of tractor side bars. Up to 268 bars per hour.

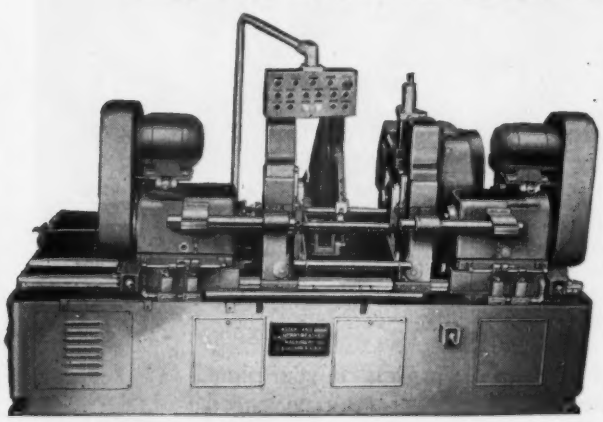
Milling and center drilling unitized. Face mills and center drills both ends of pinion shaft. Up to 230 shafts per hour.

Weight-balance milling machine unitizes weighing and subsequent metal removal. Face mills weight boss on each end of automotive connecting rod. Up to 300 pieces per hour.

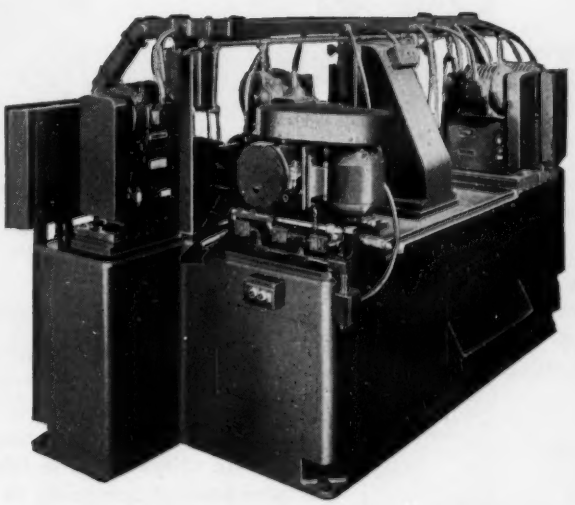


M. & M. TRANSFER MACHINES

for bar stock cut-off and double-end machining, tailored for individual requirements.



Cut-off operation simultaneous with double-end machining. Models for stock ½" through 6" diameter, lengths 8" through 40". Many forms and combinations of double-end machining.



Unusual combination of machining operations in one unit: drill, countersink, broach, cut-off, chamfer.

Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY CO. —
CLEVELAND 13, OHIO

Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

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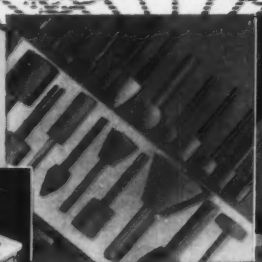
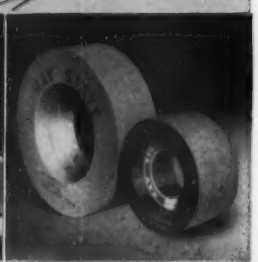


FOR HAND GRINDERS

FOR GENERAL GRINDING



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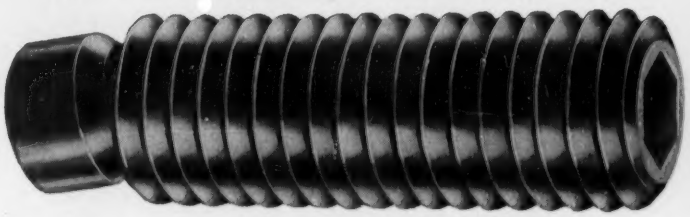
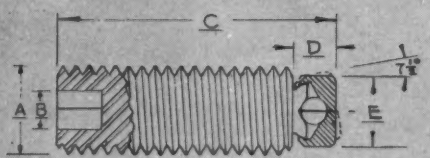


PATENT APPLIED FOR

USE STANDARD HEX KEY FOR WRENCH

SPECIFICATIONS



ITEM NO.	A*	B (HEX)	C	D	E	LOAD LBS.
SC-333	5/16-18	5/32	1	.167	.240	2290
SC-334	5/16-18	5/32	1 ½	.167	.240	2290
SC-335	5/16-18	5/32	2	.167	.240	2290
SC-339	3/8-16	3/16	1	.205	.293	3340
SC-340	3/8-16	3/16	1 ½	.205	.293	3340
SC-341	3/8-16	3/16	2	.205	.293	3340
SC-346	1/2-13	1/4	1 ½	.283	.400	7300
SC-347	1/2-13	1/4	2	.283	.400	7300
SC-351	5/8-11	5/16	2	.326	.506	11700

*ALL THREADS ARE NATIONAL COURSE — CLASS 2 FIT

- **ELIMINATES DAMAGE AND MARRING**... which occurs when the ordinary holding pad is not at 90° to clamped surface.
- **GREATER EFFECTIVE AREA**...The SCREW-BALL CLAMP automatically adjusts itself to distribute uniform pressure on work over entire pad area at all times.
- **ROTATIONAL AND AXIAL FREEDOM**... a highly polished steel ball provides almost frictionless bearing surface for both rotation and oscillation.
- **SINGLE UNIT CONSTRUCTION** . . . Pad will pass through tapped hole from either end. Saves costly installation time. Ideal for cramped interiors. *Universally adaptable for all types of fixture work.*
- **HEX SOCKET END**... permits full utilization of screw length and minimizes projection interference — uses standard Hex Key for wrench which simplifies pressure adjustments.
- **ECONOMICAL**... screw portion machined from heat-treated alloy steel for long life and high strength. Rust-proofed to prevent deterioration in stock or freezing in fixtures — may be reused again and again. Contact surface of pad is of sufficiently soft material to prevent marring work.

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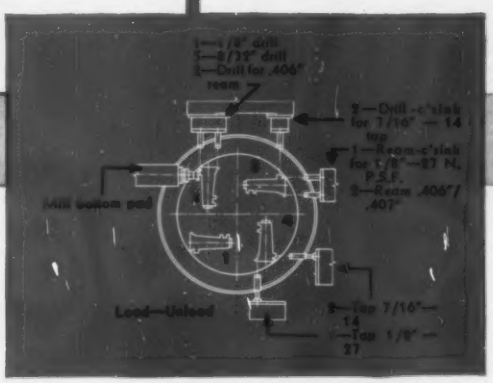
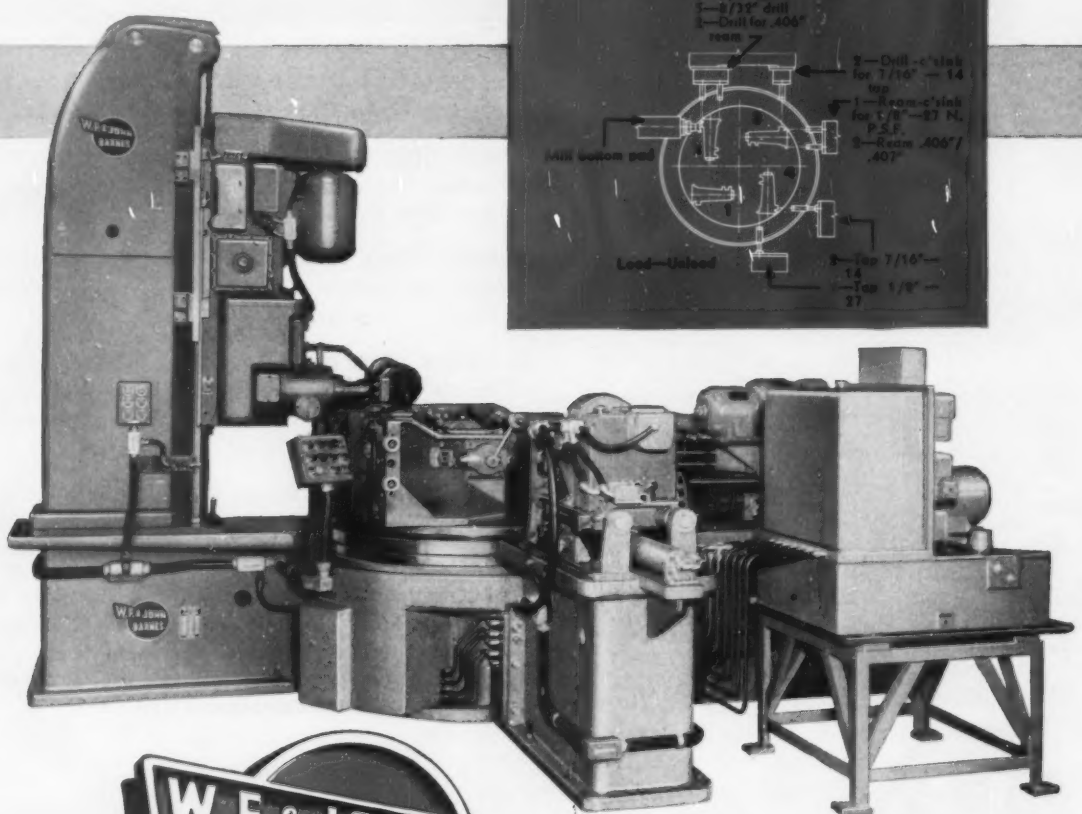
118 *Pieces per hour* 35 *Operations....*

TRANSMISSION EXTENSIONS MACHINED TO CLOSE TOLERANCES ON COMPANION UNITS

Here is another typical example of how W. F. & John Barnes coordinated special machine engineering and building service helps solve complex machining problems. These two companion units, designed to machine cast aluminum automobile transmission extension housings, reduce production costs by combining operations. Note how the parts are positioned and the tooling arranged for efficient machining, and how the over-all design conserves floor space. The two machines perform 35 operations at the required gross production rate of 118 pieces per hour. Whether your production requires large or small machines, you'll find the coordinated services at Barnes can help you solve problems quickly and efficiently.

Cast Aluminum Transmission Extension Housing





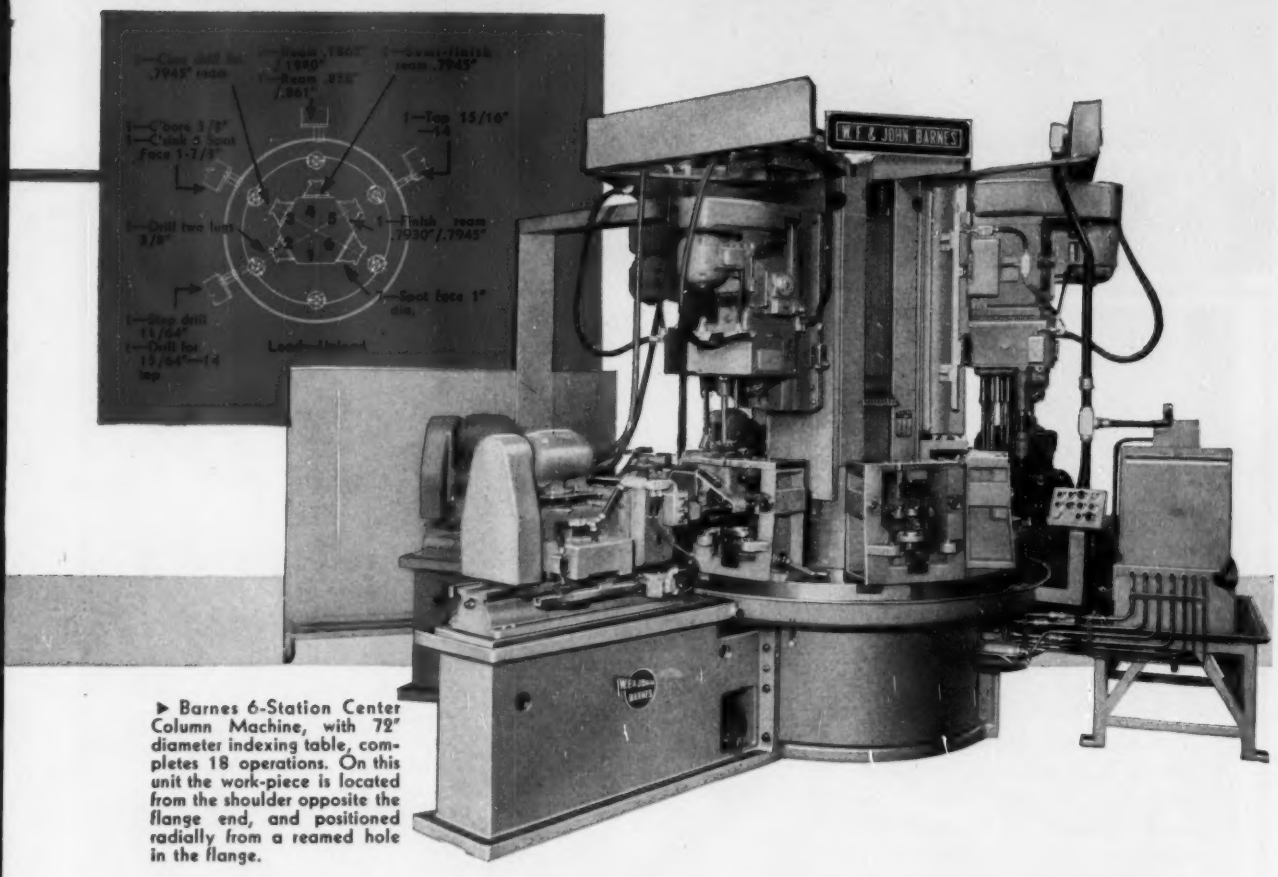
Barnes 4-Station Special Machine with 48" diameter hydraulically operated rotating table. This unit performs 17 operations. Vertical milling of bottom pad in Station No. 2 is completed with a retracting spindle. Fixtures locate part on end bores.

W. F. & JOHN BARNES

W. F. & JOHN BARNES COMPANY

MULTIPLE SPINDLE DRILLING • BORING • TAPPING MACHINES

....ON W. F. & JOHN BARNES SPECIAL MACHINES



▶ Barnes 6-Station Center Column Machine, with 72" diameter indexing table, completes 18 operations. On this unit the work-piece is located from the shoulder opposite the flange end, and positioned radially from a reamed hole in the flange.

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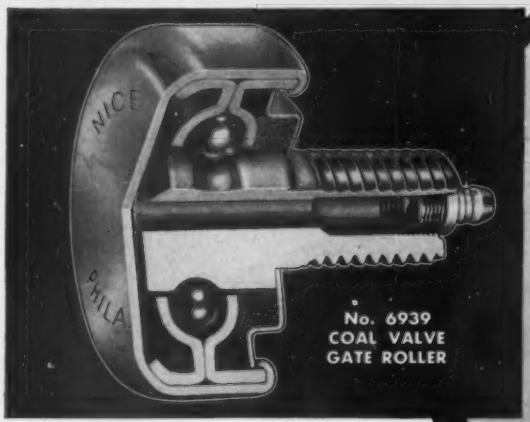

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Once again forecasters and economists tell us that supply exceeds demand and only the alert and efficient will survive the "acid test" of the new Buyers' Market.

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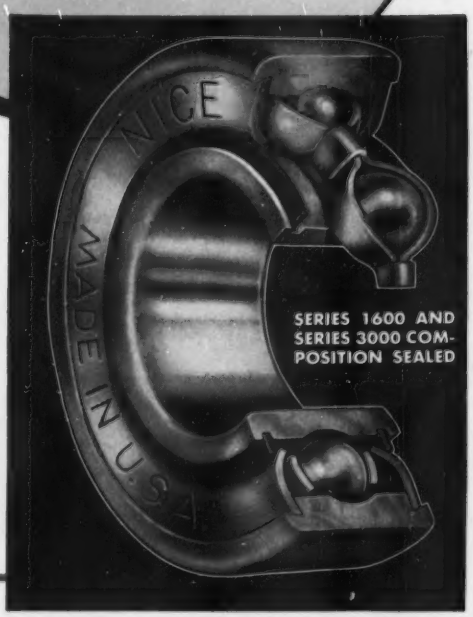
For complete information on the NICE LINE . . . . . write for Catalog No. 150.



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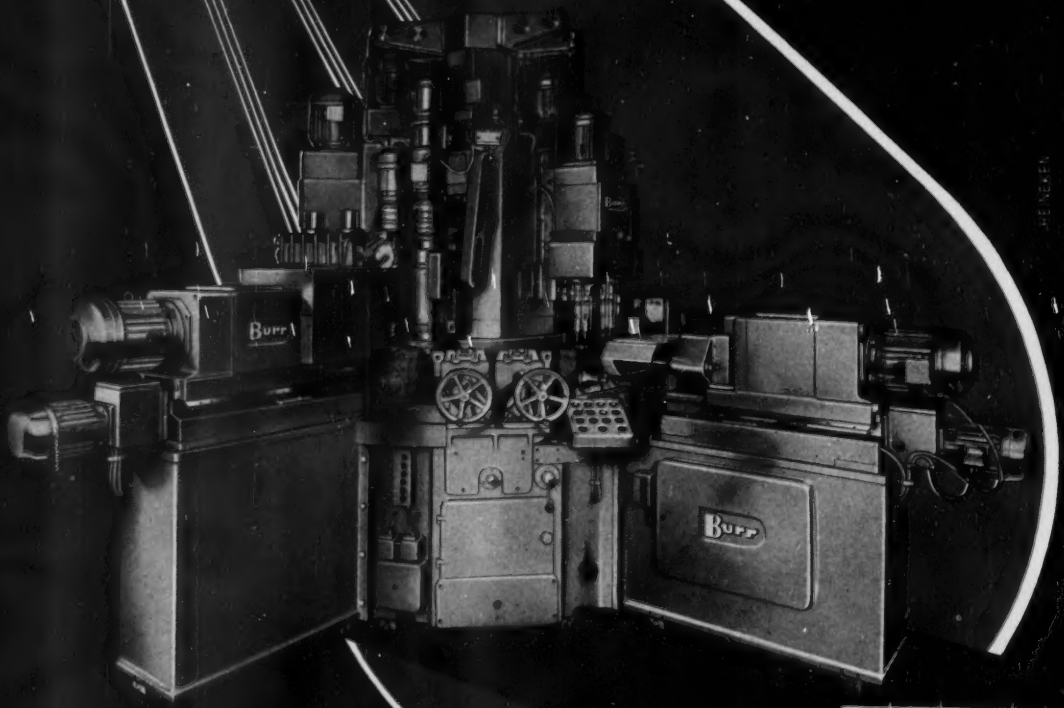
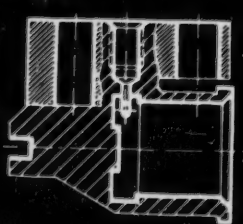


Mechanical - Hydraulic - Pneumatic Indexing Table Machine with 71" table for working brake cylinders (mill, saw, bore, countersink, chamfer, face, turn o.d. groove, recess, thread).



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SIMPLEX 3U 2-Way Hydraulic Feed Precision Boring Machine complete with two #4 SIMPLEX self contained automatically lubricated precision boring heads.

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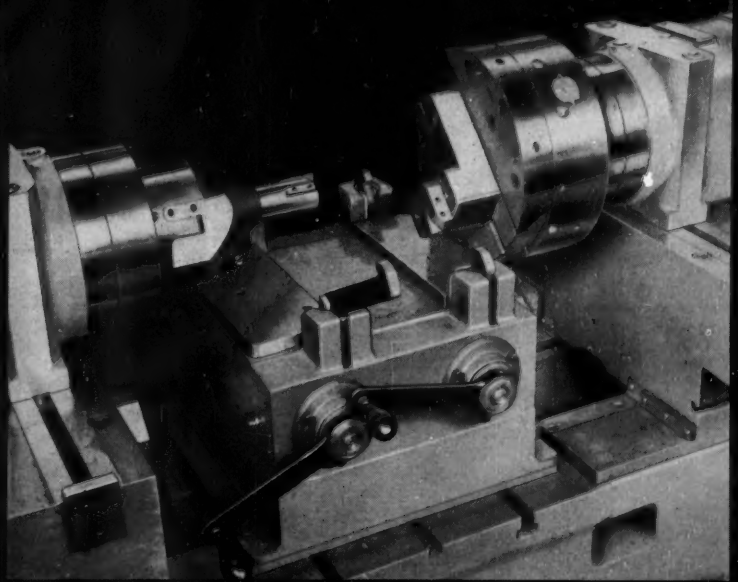
PRECISION BORING MACHINES

Transmission case showing areas which are bored, chamfered and faced.



Close up of the manually clamped type work holding fixture and tooling with a hydraulically actuated cross facing head.

That goes for machine tools, too!

Even when machining at high speeds and feeds, Antisep All-Purpose Base solutions remove heat so swiftly that smoke has no chance to get started. Parts come off cool. Cutting tools last longer. Operators are better satisfied.

You can dilute Antisep A. P. Base heavily —as much as 1 part to 30 of water—and use it for general machine work as well as for automatics. Latest case-study booklet gives you scores of examples of Antisep's great cooling ability, safety, finish, and speed. Get a copy of this informative book without cost to you, from E. F. Houghton & Co., Philadelphia 33, Pa.

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A New England tool company reports that switching to Antisep gave them the top-quality finish demanded in their production of Diesel connecting rod nuts ... and much cleaner work. SAE 4140 steel is the metal machined on a Warner & Swasey No. 5. Antisep Base, diluted with water, cost 22c per gallon and replaced former coolant costing over 70c per gallon.

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1 TWO-LUG INVERTED ANCHOR NUT For use where clearance or other considerations make it necessary to mount the nut upside down. Clearance hole must be provided for the barrel. Nylon inserts.

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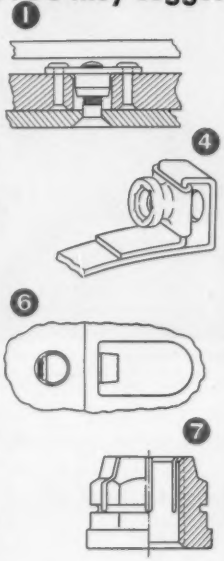
5 HIGH-TEMPERATURE, CLOSE CLEARANCE DOUBLE-HEX NUT For applications where weight, wrenching area and elevated temperatures are all major considerations. Temperatures to 1200° F.



6 LIGHTWEIGHT BARREL NUT Barrel nuts permit the use of lighter forgings—and simplify machining. "Bathtub" type recesses are necessary for the bolt head only, since the barrel nut fits into regular drilled hole. Wrenching is simplified because the nut cannot turn. This is a lightweight version of the ESNA high-tensile barrel nut, for 160,000 psi bolts. Nylon inserts.

7 ACCESSORY MOUNTING NUT High-temperature nut for mounting generators or similar accessories having a keyhole-type mounting flange. Large base diameter compensates for seating area lost to slot in flange. Nut straddles slot without Brinnelling the flange. Temperature to 550° F.

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• Adjustable to 0.0002-inch, the new improved MASTUR boring tools feature precision, speed and long service life. New body and block construction permits these tools to take heavier cuts at higher speeds—to do more work in less time.

Adjusting-screw head is graduated into 50 divisions to provide readings in thousandths, and body is graduated to permit vernier readings of 0.0002-inch. The three models available have maximum boring bar capacities of 1/2, 3/4 and 1-inch and boring range from 3/8 to 15 inches.

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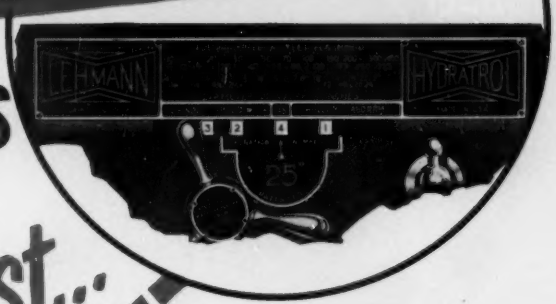

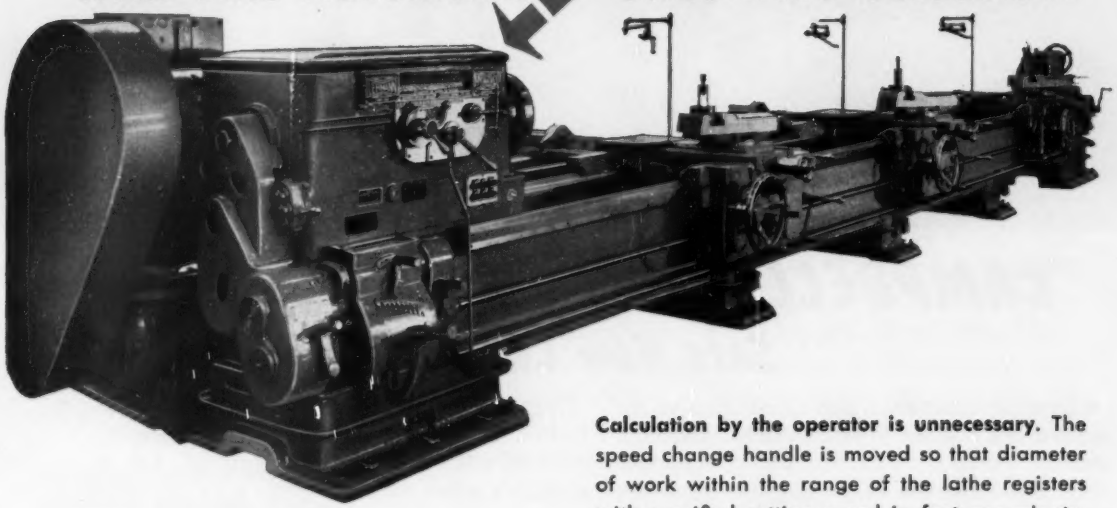

Just a turn of the hand wheel on the front of the headstock of the LEHMANN Hydratrol Lathe gives you a speed change! An automatic slide rule, co-ordinated with the movement of the handle, shows spindle revolutions per minute and indicates a slide rule calculation of the cutting speeds in feet per minute.

Calculation by the operator is unnecessary. The speed change handle is moved so that diameter of work within the range of the lathe registers with specified cutting speed in feet per minute, and the lathe automatically makes the necessary change.

The rotary selector gives 16 forward and 8 reverse speeds. No need for intermediate stop; unnecessary to disengage the friction driving clutch to change speed.

Check These Other Important Advantages:

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- **Automatic safety relay, for harmless and easy engagement of positive clutches when speeds are changed.**
- **Spindle release for chucking.**
- **Perfect, safety-control lubrication with filtered oil.**
- **Gears constantly in mesh.**

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MACHINE COMPANY
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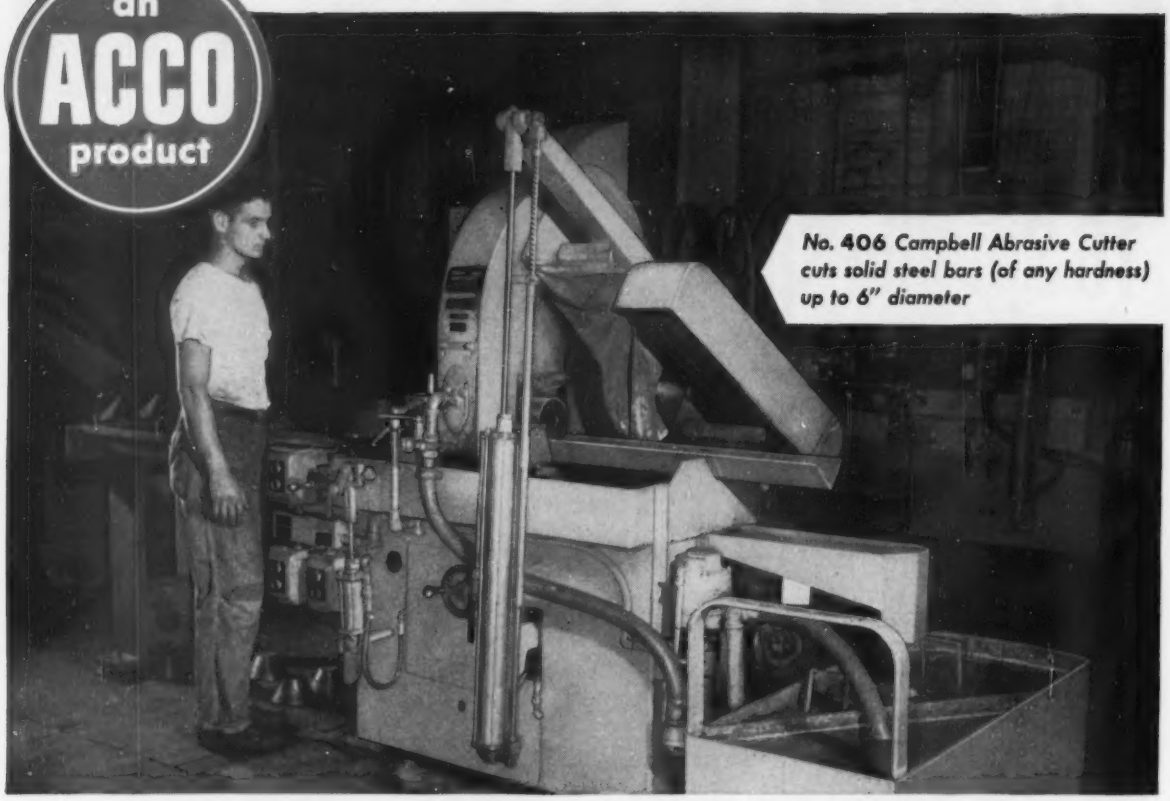


No. 406 Campbell Abrasive Cutter cuts solid steel bars (of any hardness) up to 6" diameter

CAMPBELL Abrasive Cutting Method Sets New Cut-Off Standards

• Recently CAMPBELL was called upon to cut samples of 8" x 8" No. 8740 Chrome Molybdenum steel each taking 210 minutes the old-fashioned way. The buyer was skeptical of the burn-free, smooth, close-tolerance cuts that took only 18 minutes each on the CAMPBELL NO. 480 which takes work up to 8" square. He insisted on seeing the CAMPBELL Cutter in operation cutting his own steel, which he did at a plant of one of our customers. He was convinced and placed his order for a CAMPBELL 480.

• • •

Perhaps you have cutting problems that can be solved with the speed, accuracy and quality of cuts you can get on a CAMPBELL Abrasive Cutter. If so, let us prove what this remarkable machine will do on your own material. Let us show you before your own eyes.

No matter what hardness or shape of metal you must cut repeatedly, if it will fit on one of many sizes of CAMPBELL Abrasive Cutters, which have a range up to 8" diameter solids and 20" diameter tubular, we'll show you how to cut it faster and better. Write today for "*Principles of Abrasive Cutting.*" Give us the material specifications and we'll be glad to make recommendations.

ACCO

TRADE MARK

CAMPBELL MACHINE DIVISION
AMERICAN CHAIN & CABLE

923 Connecticut Ave., Bridgeport 2, Conn.

CAMPBELL
Abrasive Cutters and Nibblers

UNIFORM

As alike as two penguins — or, "two peas in a pod" . . . that's the meaning of Bath Tap uniformity.

The size of Bath Taps is absolute . . . exact duplication is assured. No need to worry — you get the same dimensions on a tap re-order . . . stock or custom built . . . next week or next year.

Uniform manufacture is guaranteed — all Bath Tap measurements are "controlled", including pitch, major and root diameters, shank and pointing — all are concentric with the axis of the tap. Grinding is done while the tap is mounted on center holes . . . precisioned *after the tap is hardened.*

Bath engineering records preserve for ready reference, a wealth of case history experience in tap design, heat treatment, finishes and operative details on thousands of Bath Taps of all types and sizes.

Bath sales representatives are quite apt to have the answer to your threading problem at their fingertips. This much is for sure . . . once your problem is solved, you can depend on Bath Taps to be UNIFORM in manufacture and performance.

Bath engineers check every detail, to see that all Bath Taps are conditioned to do the best threading job for your requirements.

Insist on BATH TAPS for BETTER THREADS

JOHN BATH & CO., Inc.
22 Grafton St., Worcester, Mass.

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

1. Style MM on drill press. 2. Style DM on B & S automatic. 3. Style TM cutting taper threads on double-end threader. 4 Style MM on multi-spindle automatic. 5. Style DMS on turret lathe. 6. Style MM on threading machine.

The majority of producers of threaded parts prefer H&G insert chaser die heads

BECAUSE: 1 H&G INSERT CHASE DIE HEADS cut high quality threads, straight, smooth and accurate to Class 3 fits.

2 Positive trip opens chasers at exact length of thread, an advantage in threading close to a shoulder.

3 Chasers are easily changed by any operator in two or three minutes.

4 The same set of chasers can be used in several styles and sizes of die heads. This interchangeability plus the low price per set reduces chaser inventory and investment.

5 The initial low cost of chasers and their extraordinary life insure new low threading costs.

Check for free bulletin: ☐ **HOW TO SELECT PROPER DIE HEAD FOR THE JOB.**

THE EASTERN MACHINE SCREW CORPORATION • 20-40 Barclay Street, New Haven, Conn.

Learn how the

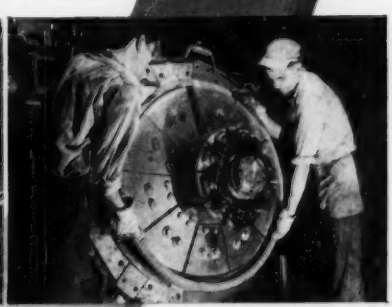
CLEVE-WELD PROCESS

cuts costs of circular steel parts

Ingenious and highly specialized processes now enable manufacturers to obtain certain types of parts at far lower cost than they themselves could make them by conventional methods. One of these is the Cleve-Weld Process for producing circular steel parts. Applicable to carbon, alloy and stainless steel rings over 6 inches in diameter and under 2½ inches thick, this process provides parts free from defects and so accurately shaped that rough-machining is usually eliminated. To describe the Cleve-Weld Process and its applications, we have prepared an illustrated 28-page brochure. We'll gladly mail a free copy to any production executive or machine designer. A handy request form is provided below.

FIRST STEP in Cleve-Weld Process: A straight steel bar is rolled into roughly circular shape.

SECOND STEP: Abutting ends are welded together by electric resistance flash butt welding.



THIRD STEP: Welded ring is stretched then compressed to prove the weld, assure exact diameter.

The CLEVE-WELD Process
for lower-cost circular steel parts

THE CLEVELAND WELDING COMPANY
West 117th Street & Berea Road, Cleveland 7, Ohio
A Subsidiary of
AMERICAN MACHINE & FOUNDRY COMPANY
NEW YORK

products are better... by design

The CLEVELAND WELDING CO., Cleveland 7, Ohio
Please send me your Cleve-Weld Process brochure.

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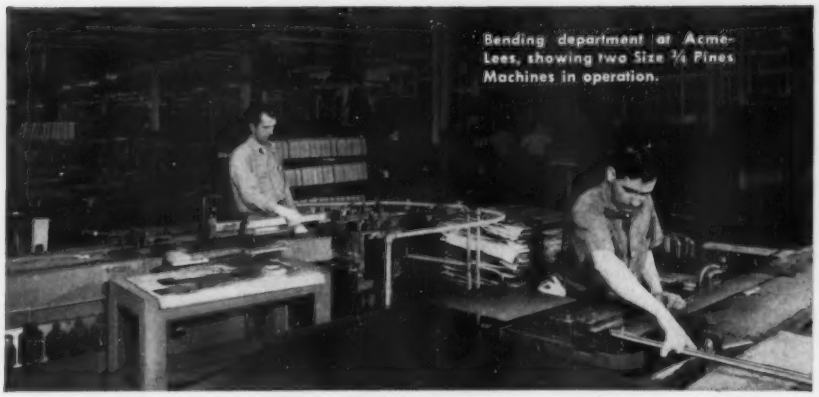
TRIM MOLDINGS PRODUCED 58% Faster

AT
ACME-LEES DIVISION
ON

PINES SIZE 3/4 AUTOMATIC BENDERS



Bending department at Acme-Lees, showing two Size ¾ Pines Machines in operation.

◀ Tooling for compression-bending stainless steel trim strips. First and fourth bends are located from a hinged stop on the swinging arm; second and third, from stops on top of machine.

◀ Tooling for draw-bending brass trim molding to 85° on a 1⅜" radius. Three different sizes of molding are handled with this same tooling by simply adjusting the distance between bends.

SKILLFUL TOOLING PRODUCES SMOOTH 1½" RADIUS BENDS IN .020" TYPE 430 STAINLESS STEEL

Here's a typical result story indicative of the bending skill of Acme-Lees Division, Muncie, Indiana, specialists in fabricating decorative trim moldings and extruded shapes for Appliance and Automotive Manufacturers. On a Size ¾ Pines Automatic Bender, .020" Type 430 stainless steel trim moldings are now formed with four unusually smooth 90° bends to a 1½" radius. Production speed is today 58% faster than by former manual bending methods. Current production is rated at 456 bends per hour as compared to 288 by manual methods.

HYDRAULIC ACTUATION REDUCES SCRAP LOSSES

As shown, the tooling is accurately machined to fit the shape of the delicate molding. A bronze wiper shoe eliminates marring the exterior finish. The operator simply positions the workpiece and starts the hydraulic clamping and bending cycle by push button. The uniform, dependable hydraulic stroke of the Pines Bender assures fast, accurate bends which reduce scrap losses and simplify assembly problems.

INVESTIGATE PRODUCTION BENDING

If you have bending work with tubing, pipe, bars, extruded or rolled shapes, it may pay you to tool for production bending the "Pines-Way". Pines engineers will work with you on any bending problem without obligation.

WRITE FOR *Free* DATA SHEETS

Write for free copies of "Pines News" — illustrate actual bending applications, give details on tooling and cost-cutting production techniques on a wide range of work.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery

672 WALNUT • AURORA, ILLINOIS

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY

Cuts them by the Dozen!

...AT A FASTER RATE

...FOR A LONGER TIME

...WITH LESS POWER

..... High speed steel, shockproof segments curl the chips out of the cut for cooler, smoother, faster cutting. Replaceable tooth segments provide an economical method of substituting worn-out teeth. Segmental cold saws are just one type in the complete Atkins line of metal cutting saws.

WHATEVER YOU SAW, THERE'S AN ATKINS SAW THAT DOES IT BETTER!

ATKINS

ATKINS SAW DIVISION
BORG-WARNER CORPORATION
INDIANAPOLIS 9, INDIANA

ATKINS Silver Steel SAWS

B-W ENGINEERING PRODUCTION

Latest development for production shops...

benchmaster Koil Kradle

Automatically feeds coil stock as required without adjustment or operator attention!

Automatically feeds all types of coiled material—wire or strip—to punch presses, shears, slitters, forming rolls, etc.

Supplies stock only as machine needs it! Motor operates intermittently by means of slack loop control.

Adjustable Timer—Provides a shut-off delay after motor switch is tripped. A slack loop of predetermined length is then formed from which forming machine can draw.

Adjustable width control—Reel space is quickly adjusted to accommodate varying roll sizes by rotating a crank. Steel guide plate is moved laterally by three lead screws, simultaneously driven by roller chain.

Reversible motor—Operates in either direction for feeding or rewinding stock. Reversing switch is supplied as standard equipment.

Easy loading—Slack loop actuating bar lifts up, exposing entire reel area. Coils are rolled up ramp, eliminating all lifting.

4 power driven rolls, linked by roller chain insure positive reel drive. Rolls are heat-treated for maximum life.

Anti-friction pillow blocks—Power rolls and back-stop roll are mounted in cast iron pillow blocks, each equipped with roller type needle bearings for long life and trouble-free operation. Alemite fittings permit easy lubrication.

The Benchmaster Koil Kradle is designed to fulfill a wide variety of feeding problems. It automatically supplies a slack loop of material feeding any machine from the slack loop rather than from the weight of the coil. Material fed over the actuating bar triggers a micro-switch as the slack loop tightens. The power rolls then rotate the coil, forming a new slack loop; correct loop size is uniformly maintained for any machine requirement, with no attention from the operator! Standard coil speed, continuous operation, 90 feet per minute.

THREE SIZES

Model	Load Capacity	Roll Width	Roll Diameter	Motor h.p. & phase*	Approx. Shipping Wt.
310	1200 lbs.	10"	36"	¼ h.p. single phase 110 V ac ball bearing, capacitor type. (3 phase available)	302 lbs.
313	1200 lbs.	13"	36"		310 lbs.
315	1200 lbs.	15"	36"		328 lbs.

*All motors reversible, reversing switch supplied as standard equipment.

See your dealer or contact Benchmaster Manufacturing Company 1835 West Rosecrans Avenue, Gardena, Calif.

benchmaster World's largest manufacturer of small punch presses and mills.

What do you know about the Moly-sulfide LUBRICANT?

A LITTLE DOES A LOT

You may have heard about a highly successful solid-film lubricant which is giving remarkable results in the shop and in the field.

In one 40-page booklet we have collected 154 detailed case-histories describing how difficult lubrication problems have been overcome by molybdenum sulfide. If you wish to be up to date about this solid-film lubricant, write for a free copy now.

THE LUBRICANT OF MANY USES

Moly-sulfide
A LITTLE DOES A LOT

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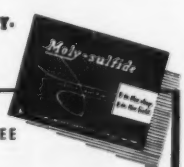

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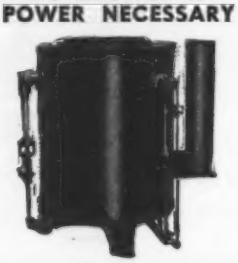
NO BLOWER or POWER NECESSARY



UP TO 1650° F. QUICKLY ATTAINABLE

Just connect to your gas supply and this BUZZER Atmospheric Pot Furnace is ready for operation. An innovation in design they are unbeatable for salt bath or lead hardening. Even heat, close control, high efficiency are only few of the many features. Available in many sizes.

Send today for the BUZZER catalog.

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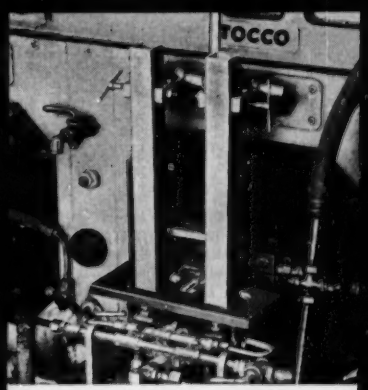
Costs down 67%
Production up 400%



TOCCO-brazing drive shaft assemblies—two at a time. Photo—courtesy Mechanics Universal Joint Division of Borg-Warner Corporation.

with TOCCO* Induction Brazing

The shift from welding to TOCCO* induction brazing of the drive shaft assembly pictured here is typical of savings accomplished by TOCCO in over a thousand of America's leading metal-working plants. If you have brazing, soldering, heat-treating or heating for forming or forging operations in your plant TOCCO can probably save you money too.

COSTS DOWN 67%—Mechanics Universal Joint Division of Borg-Warner reports a 67% cost reduction in TOCCO-brazing yokes to tubing in the manufacture of power transmission shafts. Formerly, parts were hand-welded.

PRODUCTION UP 400%—Automatic TOCCO increases production from 11 to 45 pieces per hour—400% faster than former method. In addition TOCCO-brazing produces a cleaner, neater joint than possible with previous method.

TOCCO Engineers are glad to survey your plant, without obligation, of course, to determine where TOCCO Induction Heating can speed your production and cut your manufacturing costs.

THE OHIO CRANKSHAFT COMPANY

TOCCO

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NEW FREE BULLETIN

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Dept. B-1, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening.

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Now... From one outstanding source!

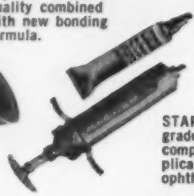
All Your Diamond Abrasive Requirements

THE Star Dust LINE!

A COMPLETE RANGE OF LABORATORY GRADED DIAMOND ABRASIVES FOR EVERY PURPOSE

STAR DUST DIAMOND WHEELS AND HONES
Superior diamond quality combined with new bonding formula.

STAR DUST
Laboratory graded Pure Diamond Powders



STAR DUST Laboratory graded diamond lapping compounds in 18 gram applicator gun—or in 5 gram ophthalmic tipped tube.

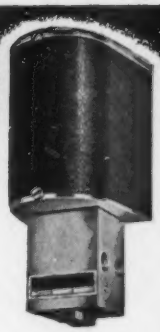
You can put your confidence in the STAR DUST line as so many others do because STAR DUST quality is consistent quality—the result of our special process of laboratory crushing and grading to achieve uniform nodular shape. That means *all* particles work for you. Be "Laps Ahead." For easier grinding and mirror finishes specify STAR DUST products.

For complete information and catalog write Dept. M3.

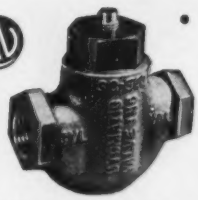
ACE ABRASIVE LABORATORIES

NEW ADDRESS: 35 ROSELLE STREET, MINEOLA, N. Y.

Solenoid VALVES



PILOT VALVES
3-WAY 4-WAY
For operating Master Valves and Small Cylinders



Speed Control VALVE
Controls speed of Air and Hydraulic Cylinders

3-Way and 4-Way VALVES
Pilot Operated
Sizes ¼" — ⅜"
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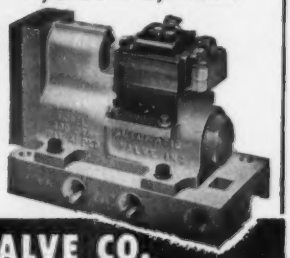

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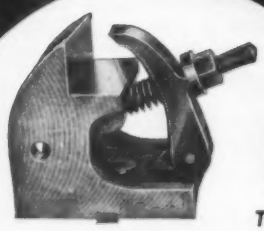
CUT SET-UP COSTS HUNDREDS OF WAYS WITH HART MILLING FIXTURES



"Masters of A Thousand Set-ups"

Eliminate the need for many special expensive jigs and fixtures.

You will save time and money on most set-ups with Hart Milling Fixtures. They hold round, hexagonal, octagonal or square stock, for miller, shaper, drill press and tapper; they reduce set-up time and speed production. Hart Milling Fixtures are made in four useful sizes, and designed to be used in horizontal or vertical position. Let us send you full description and prices.

Write for illustrated folder

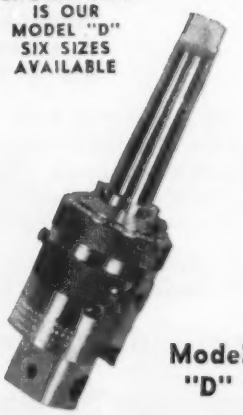
WALTER W. FIELD & SON, INC.
39 Hayward St., Cambridge 42, Mass.

SOONER or LATER
YOU WILL COME TO KNOW THAT "A BORING HEAD THAT WON'T FACE IS NOT COMPLETE"

SHOWN HERE IS OUR MODEL "D" SIX SIZES AVAILABLE

REDESIGNED, MANY NEW FEATURES

ALL HAVE POWER FEED FOR FACING!



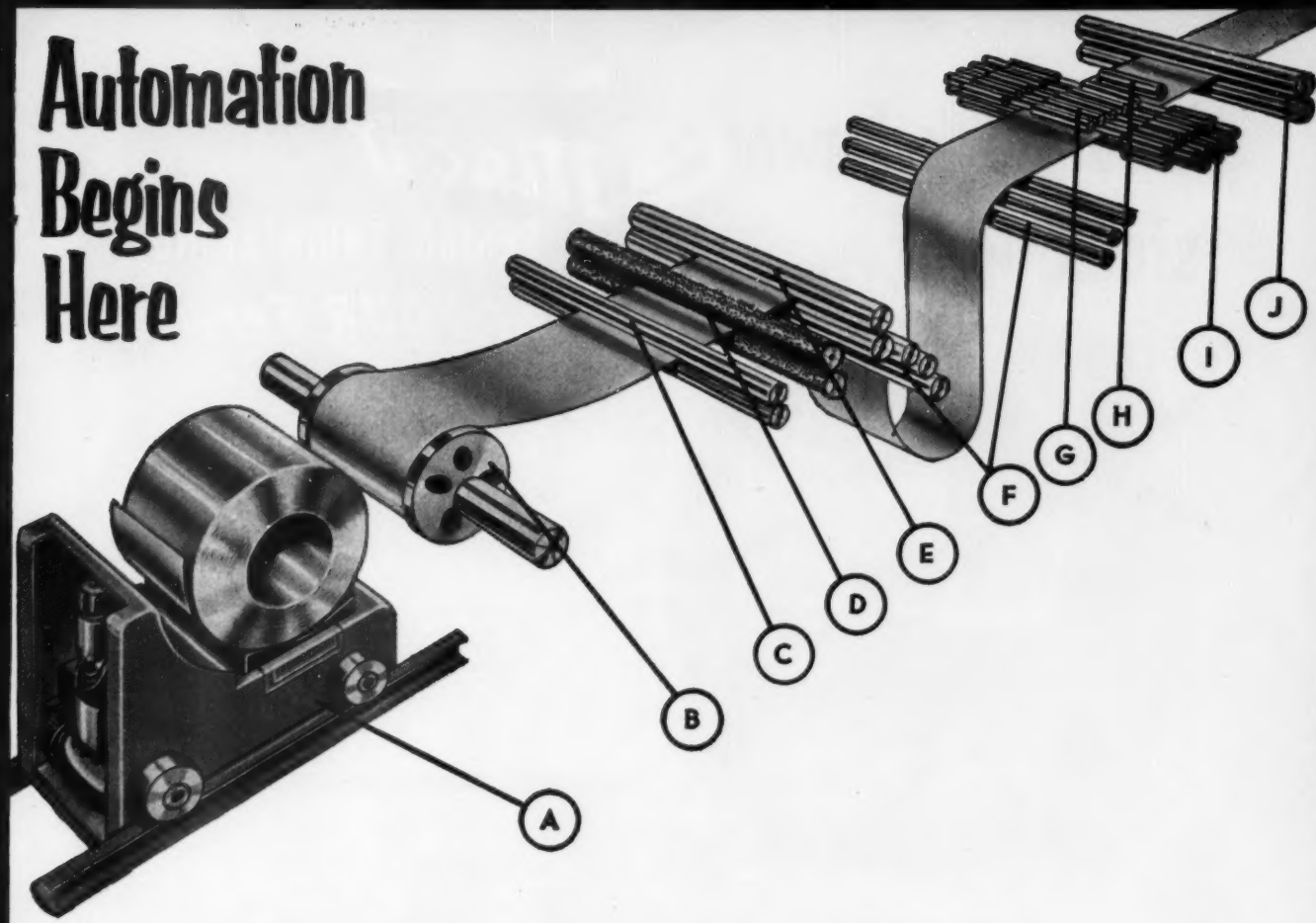
Model "D"

Write Today for Complete Details

CHANDLER TOOL COMPANY
MUNCIE, INDIANA

COMBINED BORING & FACING TOOL HEADS
Chandler-Duplex

Automation Begins Here



Automation—the automatic handling of work in process — permits manufacturers to combat high labor and material costs by boosting man-hour production. McKay has played a large part in this movement by designing and building "automated" equipment for the automotive and steel fabricating industries.

For example, coil feed lines of the type illustrated above were designed and built by McKay for several leading automotive firms. They are used to automatically feed coil stock into square shears or blanking presses, thus eliminating inefficient and laborious methods of manually feeding these machines.

TYPICAL LINE EQUIPMENT

(A) Hydraulic Loading Car for stand-by coil.

(B) Cone Type Coil Holder handles wide range of coil I.D.'s and O.D.'s.

(C) Guide Rolls to direct strip into brush rolls.

(D) Brush Rolls with solvent sprays to clean strip.

(E) Driven Pinch Rolls for pulling coil stock and filling storage loop.

(F) Guide Rolls to support loop.

(G, I, J & H) Feeder unit consisting of Backed-Up Leveler **(G-I)** and pinch rolls **(J)** is powered by D.C. drive which is controlled by a measuring device driven from measuring rolls **(H)**. The feeder flattens the strip and accurately measures it into open press dies or through shear knives.

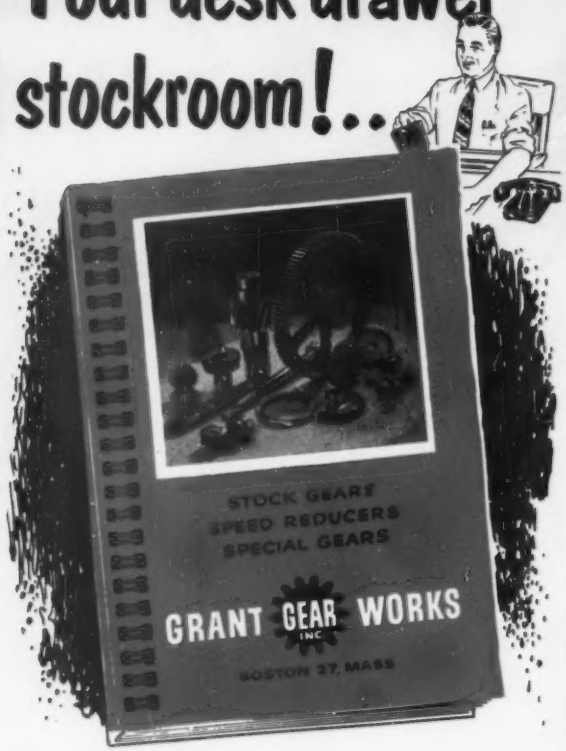
Line operation is synchronized with the press or shear for maximum production. McKay builds these units with design, speed, and capacity dictated by your job requirements.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

Your desk drawer stockroom!...



Yes, you can keep your stock of gears right in your desk drawer. It's simple with the new Grant catalog. There's no need of *carrying* a large inventory of gears *on hand* when you can find what you need at Grant—with delivery made to fit your schedule.

Whether it's gears, sprockets, or speed reducers, you'll find what you need in this new catalog. Better get a copy for your desk drawer now.

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You can depend on over three-quarters of a century of Grant experience to produce custom gears to your specifications.

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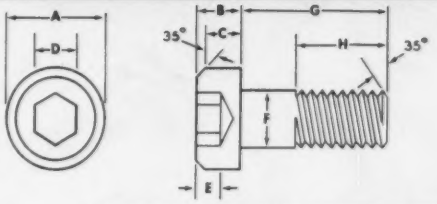
Mac-it®

DESIGN ENGINEERING at YOUR Service..



MAC-IT PARTS COMPANY

MATERIAL SAE 4140 STEEL ALLOY - ROCKWELL
FINISH CHROMIUM PLATING ON STEEL G.M. 4251-
TOLERANCE IN LENGTH THE TOLERANCE IN LENGTH

A	B	C	D	E	F	G	H
1/8	249	229	185	127	248	5/16	3/8

FASTENER DESIGN

Mac-it socket-head screws, providing strength without bulk, give lighter weight, streamlining, and more secure fastening to equipment you design. Whether the design problem involves standard or special screws, Mac-it will add to the appearance, efficiency and performance of the equipment. Use Mac-it Fastener Engineering Service for all problems involving screws for any type application

MAC-IT PRECISION

The precision manufacture and quality control used in making Mac-it Screws provide users with high dimensional accuracy and uniformity. All Mac-it Screws in both coarse and fine threads are held to a class-3 fit. Mac-it maintains a Fastener Engineering Service for the design, development and production of screws for all types of applications.

DISTRIBUTOR SERVICE

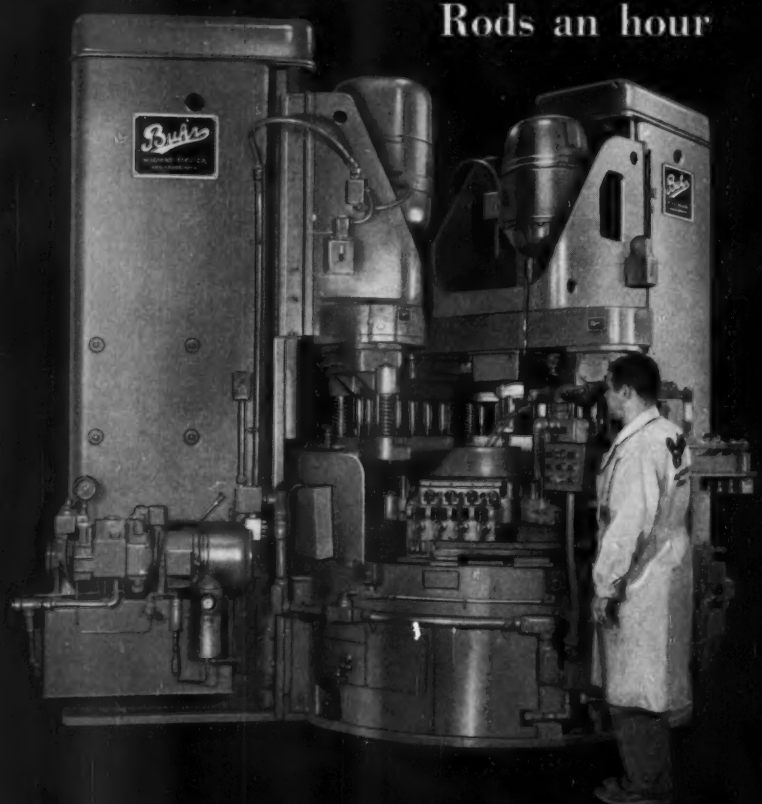
Hundreds of Mac-it distributors from coast to coast are ready to render immediate service in supplying your requirements for standard or special screw products.

MAC-IT SCREW DEPARTMENT
STRONG, CARLISLE & HAMMOND COMPANY
1392 W. 3RD. STREET • CLEVELAND 13, OHIO
Manufactured by Mac-it Parts Co., Lancaster, Pa.

Contact your nearest Mac-it distributor or the Home Office, Cleveland, Ohio, for the Mac-it Catalog No. 49 which contains full technical data.

Buhr SPECIAL...

Drills, reams and chamfers 565 Connecting Rods an hour



This Two-Column Automatic Drilling Machine
is arranged with tool-steel, laminated, hardened and ground ways.
Heavy-duty ball-bearing construction provided for all spindles.
The eight-station holding fixture is mounted
on 60″-diameter automatic Index Table.
Parts are manually loaded, hydraulically clamped and automatically ejected.
All installations comply with J.I.C. Standards.
Automatic lubrication throughout Machine.
Special safety features . . . Only one operator required.

BUHR MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

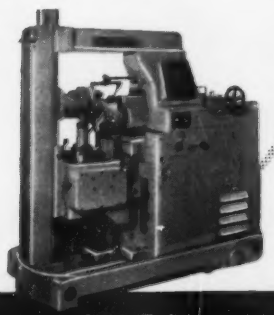
Buhr **MULTIPLE-SPINDLE HIGH PRODUCTION MACHINERY**

Staehely hobs faster

This helical gear is finish-hobbed on the new SHA 506 S type High-Speed Gear Hobber using a single-start high-speed steel hob

in 2 MINUTES

Number of teeth	29
D. P.	8.4
Face width	1"
Helix angle	16 degrees
Material	Steel of 45 tons tensile strength
2 gears loaded	
Max. spindle speeds	500 RPM
Feeds infinitely variable	



Using STAEHELY Gear Hobbers, therefore, **cuts production time by 400%** and means greater accuracy, lower costs, fewer machines and longer hob life.

STAEHELY Machine Tool Works · Wuppertal · Germany

GEARS

To Your Specifications

Over one hundred major machine tools plus our twenty-five years continuous gear production for aircraft and industrial fields are at your service.

Territories Available for Sales Representatives

ACME GEAR COMPANY

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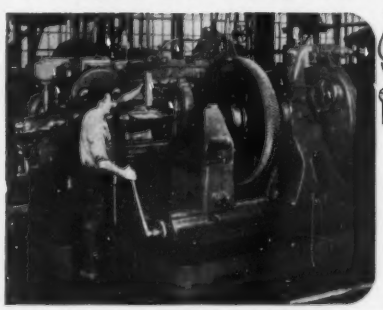
A New Arrival—



..to help make BETTER GEARS!

This 18 ton Herringbone Continuous-tooth Generator, handling gears and pinions up to 60" PD, 2 DP, is a recent addition to Stahl's modern equipment. Stahl skill and experience, plus the finest precision machines, assure accurate, durable gears in all sizes. For the economical answer to any gear problem get a Stahl estimate first.

SPURS TO 72" PD, 1 DP
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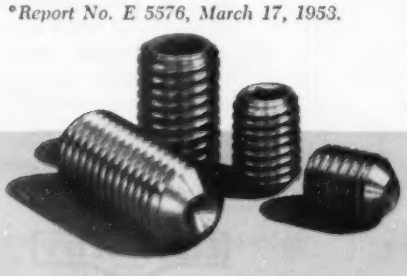

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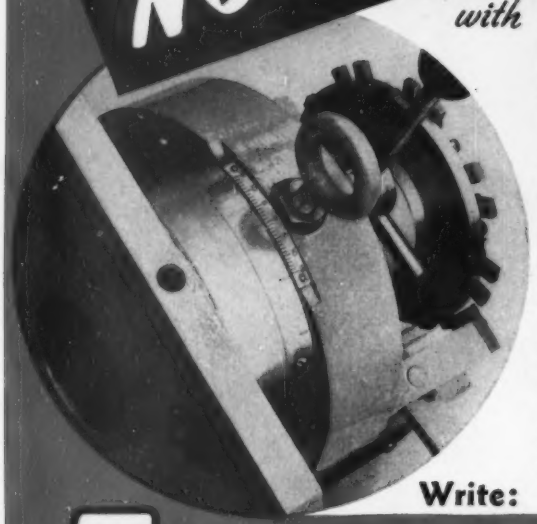

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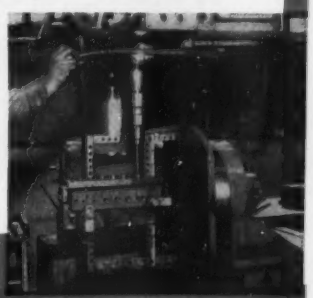

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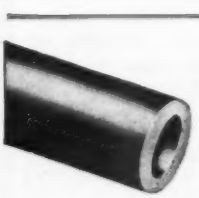

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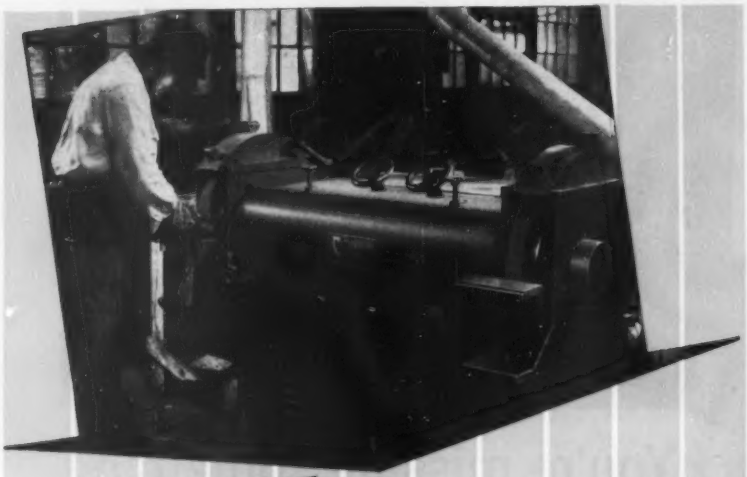

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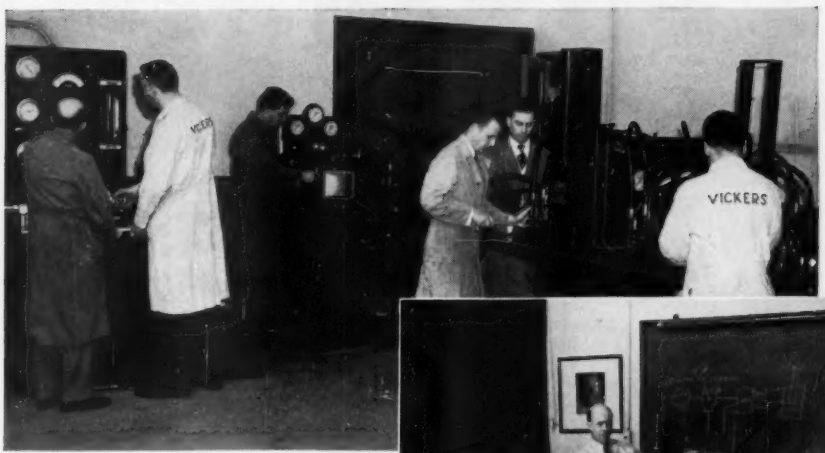

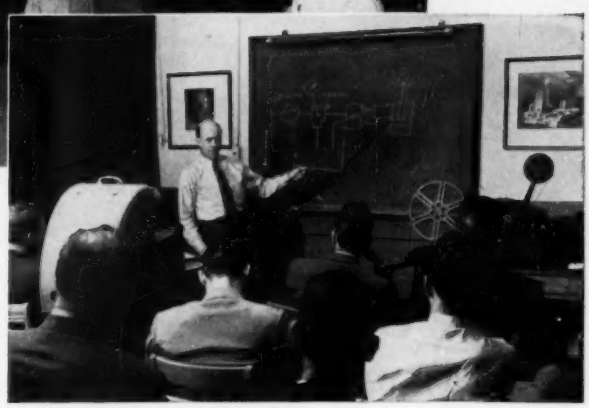

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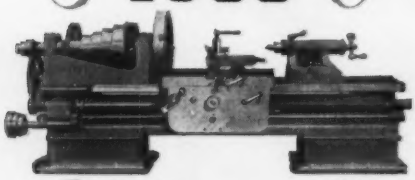

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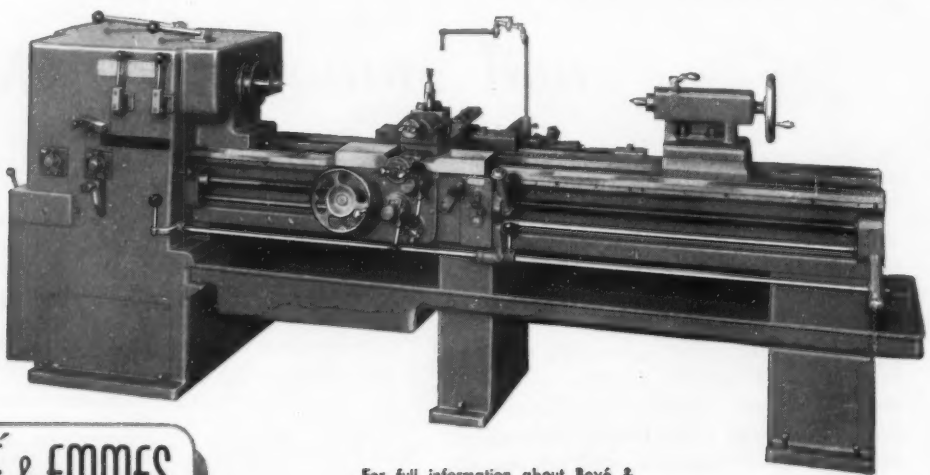

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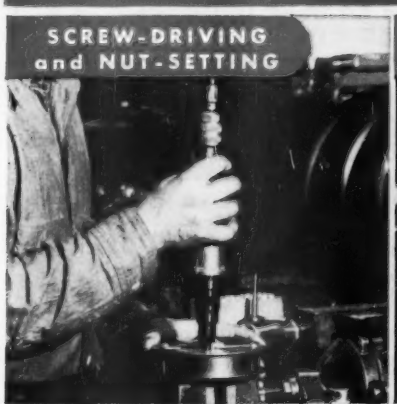

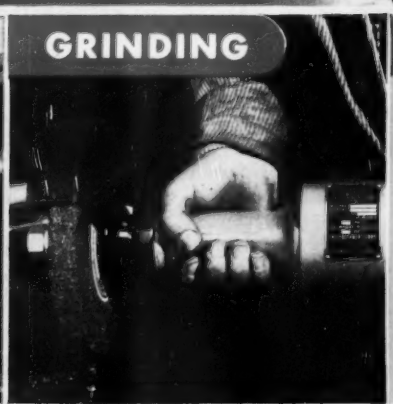

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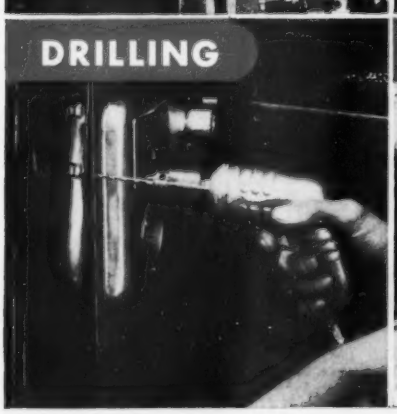

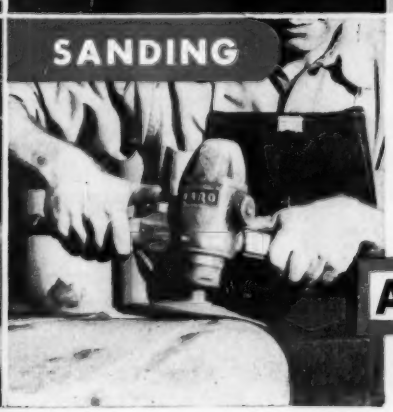

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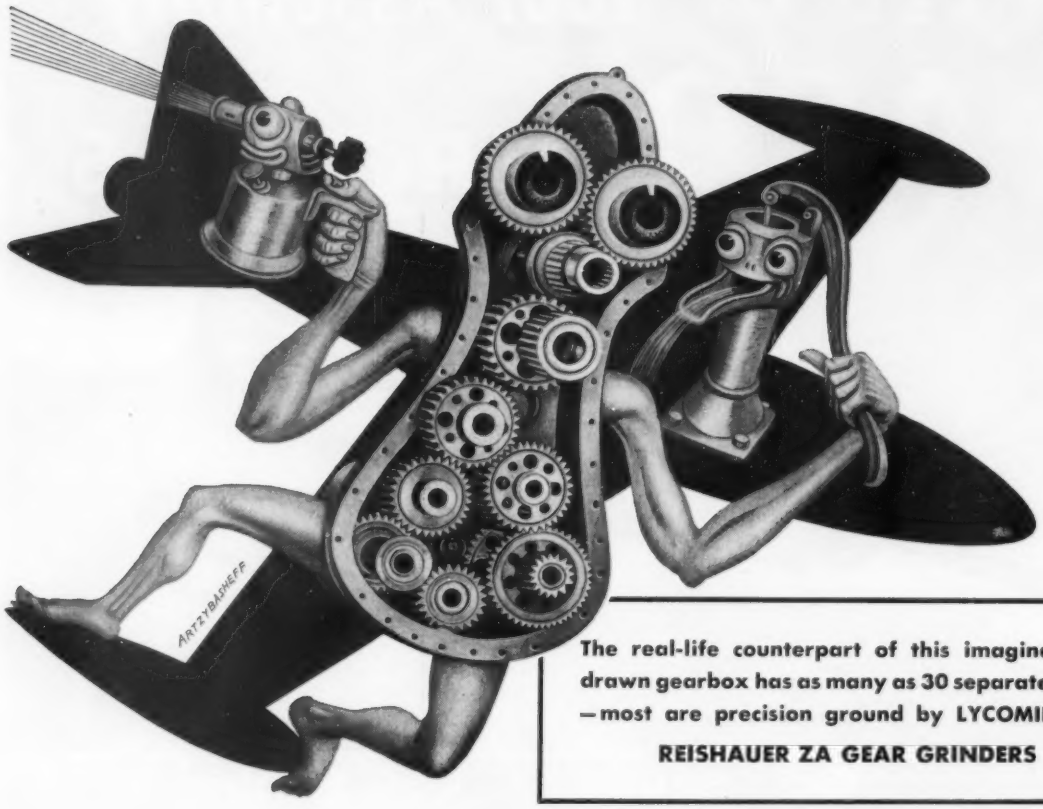

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Single-thread grinding worm and spindle of the Reishauer ZA.

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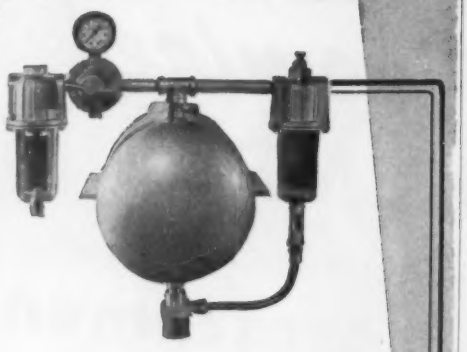

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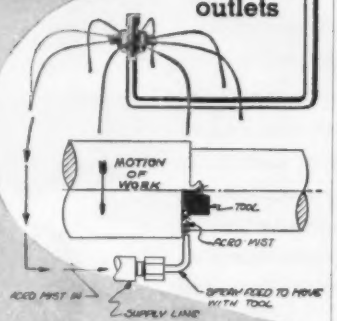

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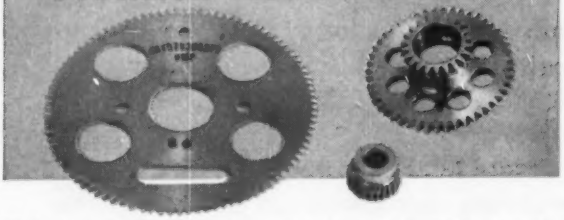

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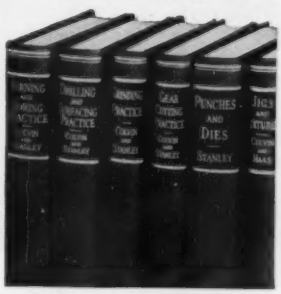

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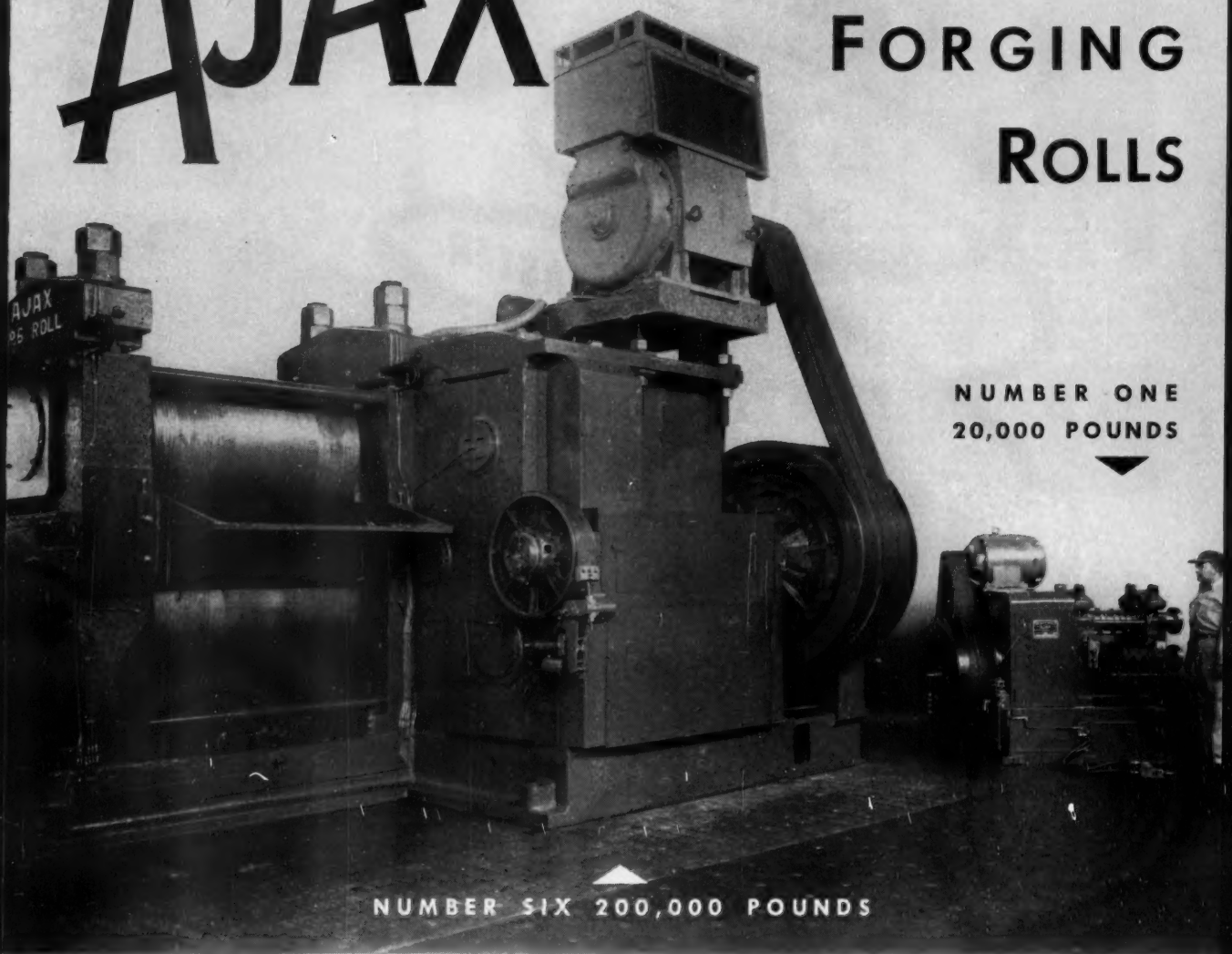
AJAX COMBINATION DIE FORGING ROLLS



NUMBER SIX specifically used for forging aircraft components. 200,000 pound AJAX FORGING ROLL shown at the left and foreground above is designed for pre-rolling blanks for subsequent DROP forgings.

NUMBER ONE universally used in aircraft, automotive, agricultural industries. 20,000 pound AJAX FORGING ROLL shown at the right above is designed for rolling reduced tapered and straight forgings and pre-rolling blanks for subsequent PRESS forgings.

BUILT IN SIX SIZES FROM NUMBER 0 TO NUMBER 6.
ILLUSTRATED AND DESCRIBED IN BULLETIN 91A.

THE AJAX MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND 17, OHIO
110 S. DEARBORN ST. CHICAGO 3, ILLINOIS
DEWART BUILDING NEW LONDON, CONN.

DO MORE...

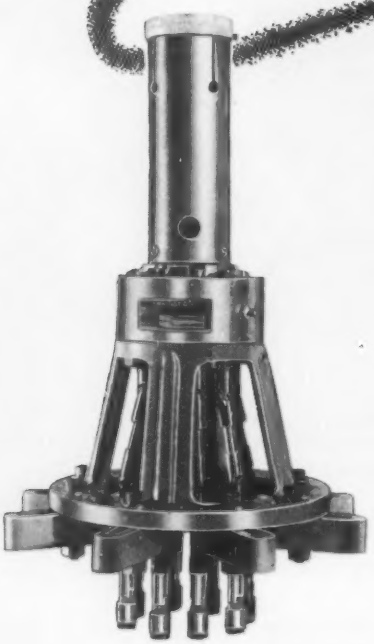
DO IT BETTER

DO IT FASTER

ERRINGTON

UNIVERSAL JOINT DRILLING & TAPPING HEADS

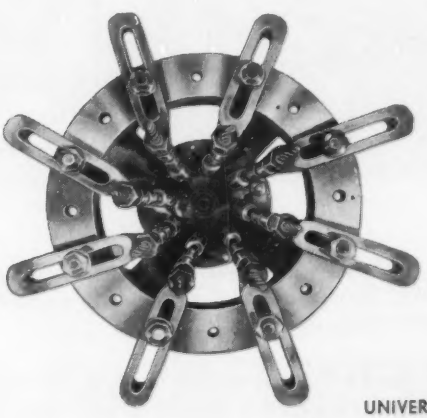
Another pair of hi-speed production tools from Errington—Universal Joint Drilling and Tapping Heads. These dependable tools are adjustable to any pattern of holes . . . are available with 4 to 12 spindles. Heads made of the best grade sand Cast Aluminum with hardened and ground gears and spindles (made in one piece). Full grooved ball thrust bearings at all thrust points and Oilite bronze radial bearings. Remember to do more . . . better . . . faster . . . rely on Errington Hi-Speed Production Tools.



UNIVERSAL JOINT TAPPING HEAD

#0—0" to ¼" Tap Capacity 4 Spindles.

#1—7/32" to ½" Tap Capacity 4 Spindles.



UNIVERSAL JOINT DRILLING HEAD

#0—0 to ¼" Full range of collets furnished.

#1—3/16 to ½"—#1 Morse Taper socket or chucks for straight shank drills.

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Established 1891
Main Office and Plant: STATEN ISLAND 4, N. Y.
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MERCURY *Grinders* LEAD THE FIELD

The proven development of traveling wheel grinders has given Mercury top position in the field. These machines are available in sizes up to 150 horsepower and with wheels as large as 42 inches in diameter. Mercury Grinders travel on smooth steel ways which are laid down in sections of one-piece construction. Grinding length is unlimited with this unique, cost-cutting design.

Precision roller bearings carry grinders smoothly over protected steel ways.

Wheels and spindle units can be changed as conditions demand.

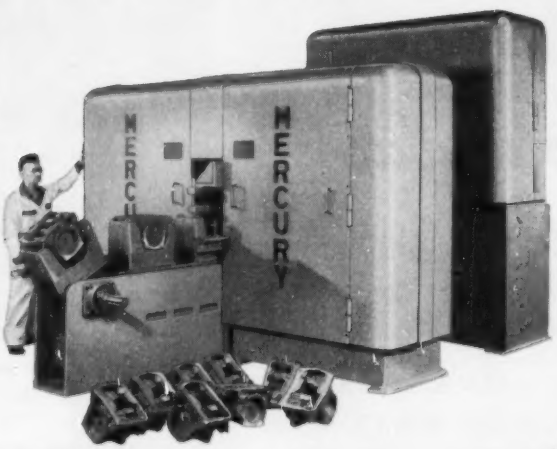
System of electrical interlocks governs pre-determined automatic movement.

Spindle overtravel is retained by smooth, positive hydraulic action.

Travel distance is limited only by job conditions and shop restrictions.

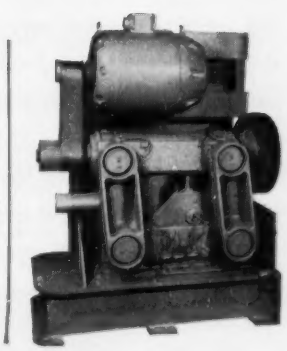
AUTOMOTIVE GRINDERS *for*

ENGINE BLOCKS
•
CYLINDER HEADS
•
MANIFOLDS
•
CRANK CASES



750 Automotive Castings Per Hour Ground on Three Sides

Many shops are setting production records in the preparation of castings for the automotive industry. Costly and inefficient manual handling is reduced to a minimum, and consistently superior finish is assured. Completely sealed for safety and protection, Mercury Automotive Grinders have simplified operation and maintenance. Available from 20 thru 100 horsepower.



Unique Toggle-Arm* action guides the wheel on the work surface. Remote control of positive hydraulic downfeed in specified increments simplifies operation.

SINCE 1933 A SYMBOL OF FINE CRAFTSMANSHIP

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MERCURY ENGINEERING CORPORATION

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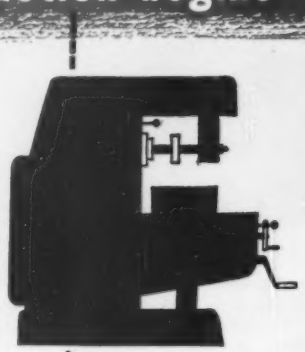
production begins with



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No tools like the right tools! Columbus Die-Tool designs and builds tools, jigs, fixtures and special machinery to meet your most exacting requirements. RESULTS: operating cost that matches your budget; production that matches your schedule; product quality that matches the demands of your market.

Contact Columbus Die-Tool & Machine Co. first—when you have a special machine problem. They are nationally known as expert designers and builders of special machinery and equipment . . . have been for over 46 years.

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Gerotor can deliver from stock . . . immediately . . . any of their standard hydraulic pumps, covering ranges as shown in the table. If you have pump requirements and need immediate service . . . call, wire or write Gerotor today.

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"QDH"	3–12	0–1200	1200
"O"	20–40	0–1000	1200

Whatever your need in hydraulic pumps or motors consult the Gerotor May engineers. *Write for free literature.*

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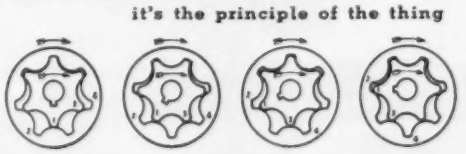
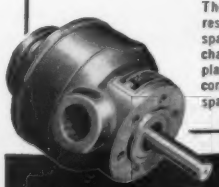
Gerotor is not just a name . . .
it's the principle of the thing



The two Gerotors revolve at different speeds, resulting in a continuous opening and closing of spaces as shown in this diagram. Follow the changing position of tooth #1 as rotation takes place. Note its relation to space #2. As rotation continues, tooth #1 gradually displaces oil from space #2, thus creating pressure.



GEROTOR
HYDRAULIC PUMPS & MOTORS

NON-FERROUS METAL TUBING—.060" to .250" O.D.
Taking "bow" or "set" out of tubing—6 in. min. to 14 ft. lengths.
RESULTS: 500% increase in production. Downtime reduced. Customers' specifications easier to meet. Maintenance at a minimum.

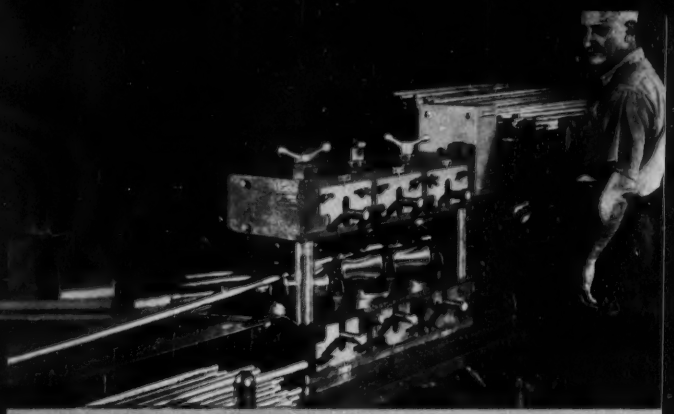
COPPER AND BRASS TUBING—⅛" up to ½" O.D.
Tubing straightened to a specification of ½ in. deviation in 12 ft. lengths.
RESULTS: Definite production cost savings. Tubing size controlled to close tolerances and absolute roundness maintained. No objectionable marking. Desirable "skin-hardening" of annealed copper tubing.

If you need straight tubing, you have a job for a MACK-HEMP *guideless* ROTARY STRAIGHTENER

NICKEL ALLOY TUBING—5/16" to ½" O.D.
Removing waves and kinks to meet customer's specifications. Deviation not more than .006 in. per foot; .018 in. in 36 in.
RESULTS: Meets customer's specifications. No scratches. Operates so fast that it does not need to run continuously to handle production.

ALUMINUM TUBES—¼" to 1¼"—60 ft. lengths
Straightening and bringing back out-of-round to roundness. Deviation .012 in. per ft.
RESULTS: Production boosted—10,000 feet of tube an hour. Tubing unmarked. Lowered production costs. Made a better product.

BUTT WELD STEEL PIPE—1½" to 4" O.D.
Taking bends out of pipe and eliminating "cooling-bed hooks."
RESULTS: High production and quality records. Maintenance, over years, exceptionally low.



Model AXY is the most popular of 12 sizes of Mack-Hemp Rotary Tubing Straighteners—a precision machine that straightens tubing from ¼" to 1⅛" O.D.; meeting straightness specification of ½ standard tolerance or better.

The application possibilities for Mack-Hemp guideless Rotary Straighteners extend through many industries. Constantly, more manufacturers of varied products which include pipe and tubing (from tiniest tube to large pipe) are placing these machines in their production lines with substantial advantage. What these Mack-Hemp guideless Rotary Straighteners are doing for them (exemplified here in some condensed case histories from our files), they may be able to accomplish for you.

Why not investigate? You can get all the details about Mack-Hemp Rotary Straighteners by writing for Bulletins No. 52 and S-7265.

MACKINTOSH-HEMPHILL COMPANY · PITTSBURGH, U.S.A.

Machinery Department

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Makers of the Rolls with the Striped Red Wabblers

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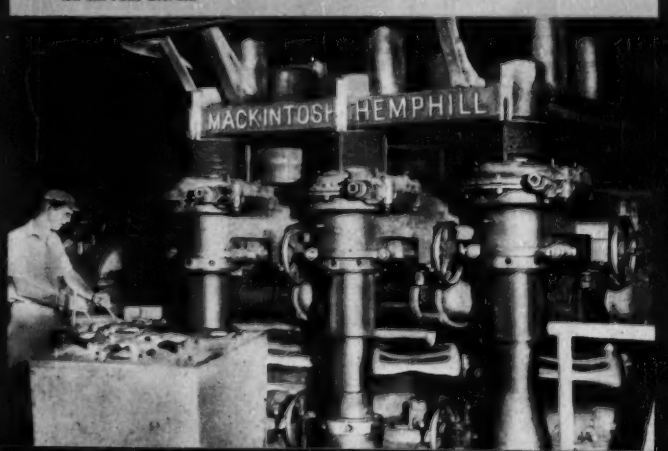
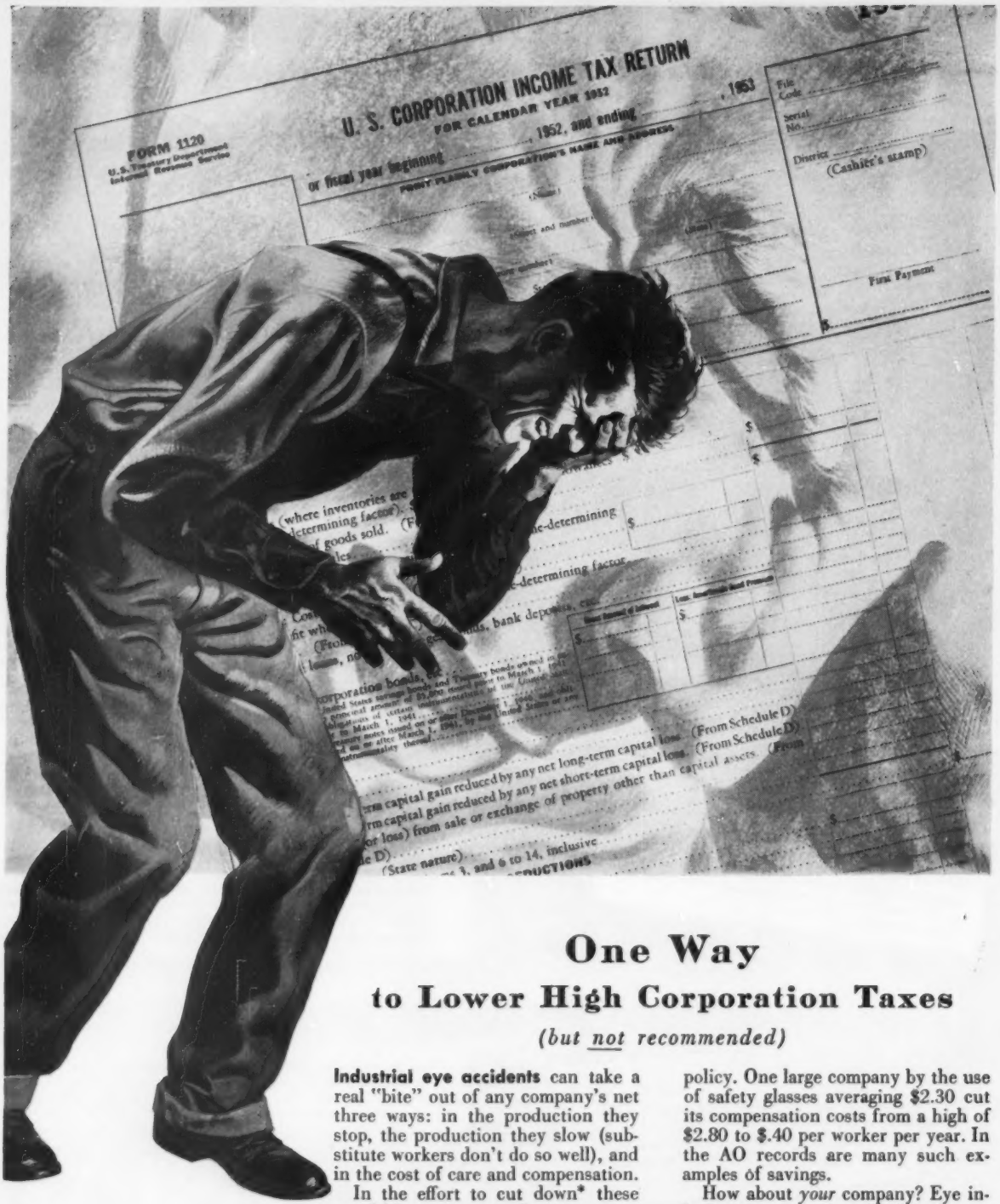
MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners . . . heavy duty engine lathes . . . shears . . . steel and special alloy castings . . . completely integrated strip mills . . . shape straighteners . . . end-thrust bearings

Model A-4 is one of the largest Mack-Hemp Rotary Tube Straighteners. It will straighten pipe (5" to 15" O.D.) in lengths up to 60 feet with virtually no deviation in straightness over the entire piece. In Mack-Hemp Straighteners there are three pairs of opposed rolls, all six rolls driven.





One Way

to Lower High Corporation Taxes

(but not recommended)

Industrial eye accidents can take a real "bite" out of any company's net three ways: in the production they stop, the production they slow (substitute workers don't do so well), and in the cost of care and compensation.

In the effort to cut down* these avoidable taxes on profits, a program that safeguards a valued worker's eyes is sound policy. One large company by the use of safety glasses averaging $2.30 cut its compensation costs from a high of $2.80 to $.40 per worker per year. In the AO records are many such examples of savings.

How about *your* company? Eye injuries are as *certain* as death and taxes unless there is a program that controls them. Ask your AO Safety Representative for complete details.

*98% of eye injuries are *eliminated* when workers wear safety goggles.

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today for booklet "Improved Industrial Vision" to American Optical Company, 4131 Vision Park, Southbridge, Mass.

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"Stay in the Safety Zone with AO Safety Equipment"

American Optical

SAFETY PRODUCTS DIVISION

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HIGH PRODUCTION TOOLING

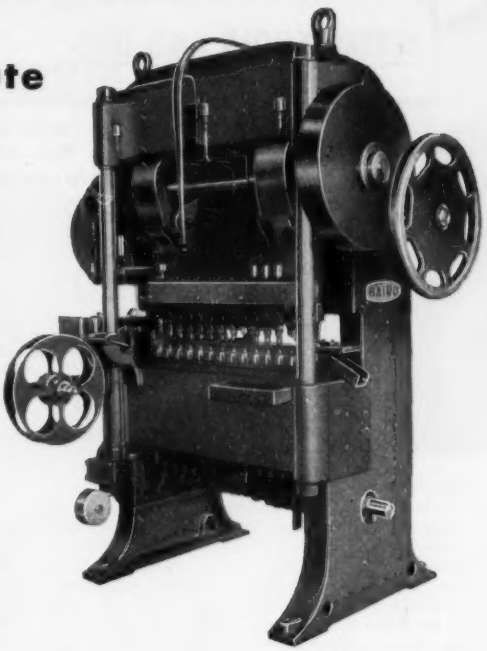
80 complete pieces per minute

FOR PROFITABLE PRODUCTION

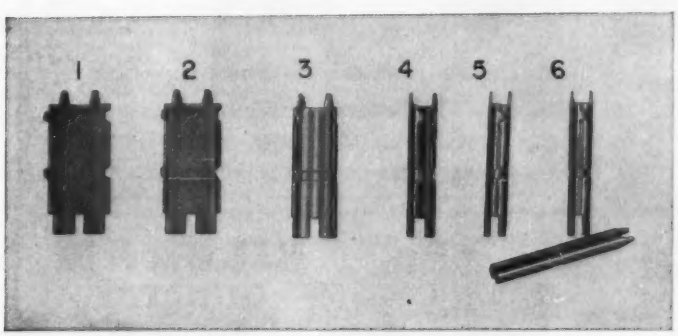
Here is low-cost, completely automatic production . . . typical of precision stamping that can be performed on the Baird Multiple Transfer Press.

For complicated work, with punch holders and die blocks . . . transfer slides and fingers . . . progressive operations through 14 stations, might include blanking, drawing, piercing, embossing, slitting, trimming, broaching, sizing, hexing, forming, inserting, and riveting. And tooling is easily replaceable for the work required.

There are 12 press sizes, taking automatically-fed coiled stock from 2½" to 4"; maximum feed length from 2" to 3½". For low-cost, volume production within its range, there's no more profitable automatic than the Baird Transfer Press. Bulletin on request.



BAIRD AUTOMATIC TRANSFER PRESS



Producing an electrical switch part

Here is a hollow shaft, used in an electrical switch, that is produced completely in a 6-station die set. At station No. 1, the part is blanked from flat stock. At No. 2, the outer edges are curled . . . and the remainder of the forming operations take place at stations No. 3, 4 and 5. Final sizing is performed at No. 6. This shaft is made in different lengths and variations, by means of interchangeable punches and dies. Production, 80 pieces per minute . . . 4800 per hour.

48A53

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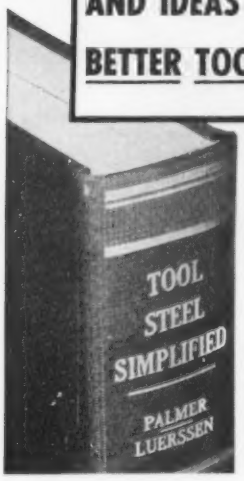
AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

why does one shop consistently produce good tools and dies ... while another runs into periodic trouble? ... *this book gives*

ALL INFORMATION, METHODS, AND IDEAS NEEDED TO PRODUCE BETTER TOOLS AND DIES



Practical Data on Popular Analyses of Tool Steels, their Selection, Heat Treatment, and Use

in the Revised, Enlarged SIXTEENTH PRINTING of this

TOOL and DIE STEEL HANDBOOK

By Palmer and Luerssen

Here's the BOOK OF ANSWERS for every man responsible for tools and dies. Shows you how to increase your company's production from present equipment—how to reduce toolmaking trial and error, conserve tool steel, avoid die troubles, simplify heat treatment. It starts "from the beginning" with *what* tool steels are, their analyses, and why one grade will outperform another on some jobs. Gives complete working information on everything from selection of the right steel to heat treating methods and equipment, hardness and toughness testing, latest data on high speed and hot work steels. 564 pages, 355 charts, photos, diagrams give you facts on: how design affects heat treatment, hardenability tests, time required to heat different tools to required hardening and drawing temperatures, furnace atmospheres, quenching, tempering, trouble-shooting.

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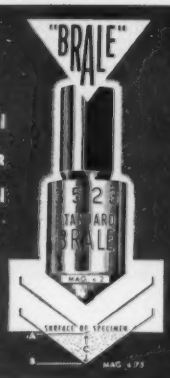
Sphero-Conical DIAMOND **BRALE*** PENETRATOR for Hardened Steel



HOW IT WORKS

A. Minor Load Penetration
B. Major Load Penetration
C. Linear measurement of penetration increase which "ROCKWELL" converts to hardness reading

BRALE Penetrator Accuracy Is Proved in Wilson's Standardizing Laboratory

One point of hardness on the Rockwell C scale equals .00008", so penetrator accuracy must be constant. That's why Wilson maintains its Standardizing Laboratory for testing and approving every BRALE penetrator.

Each BRALE is precision ground to shape under high magnification to research laboratory accuracy. Wilson's BRALE Penetrator gives true readings at all dial points. For accuracy use a diamond BRALE penetrator on your hardness tester. Write for literature.

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Feeds ferrous, non-ferrous strip or sheet ... faster, safer. Use for stamping, shearing. Right or left hand non-slip fitted grip, self-adjusting. Sturay, hardened work surfaces. FULLY GUARANTEED.

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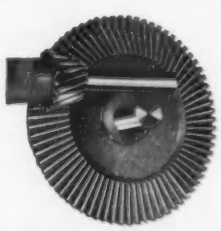

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ALL TYPES • ALL MATERIALS

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Some of the thousands of varied parts formed on the Steelweld Press. These involve bends and curves of every description in many plate thicknesses. Bars of heavy cross-section, usually requiring a bulldozer, are formed into semi-circles for gear rims and similar uses.

800 Tons of Plate Formed Monthly

STEELWELD PRESS *Produces* Infinite Variety of Curves and Bends

This Steelweld Press is rated at ½"x14'-0" mild steel. With the 24-inch bed and ram extension at each end, it will bend plate that can clear by the 18-inch deep throat to 18'-6" long. Two cross shafts with foot pedals are provided for operating the press. The lower shaft is for normal operation while the upper shaft brings the reversing flywheel into action to back the ram off the work whenever desired.

EVERY month some 800 tons of plate of all thicknesses to one-half inch is formed with bends and curves of every description on a Steelweld Press. The machine is in operation nine hours a day.

Since parts formed are produced in very small duplicate quantities, the dies and machine settings usually must be changed many times during a day. Because of the ease with which Steelweld Presses can be set up, the operators can do this quickly and easily.

Steelweld Presses offer so many advantages that we urge you to write for the catalog below and get all the facts on them. Hundreds of these machines are now in use for bending, forming and punching operations of every description.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

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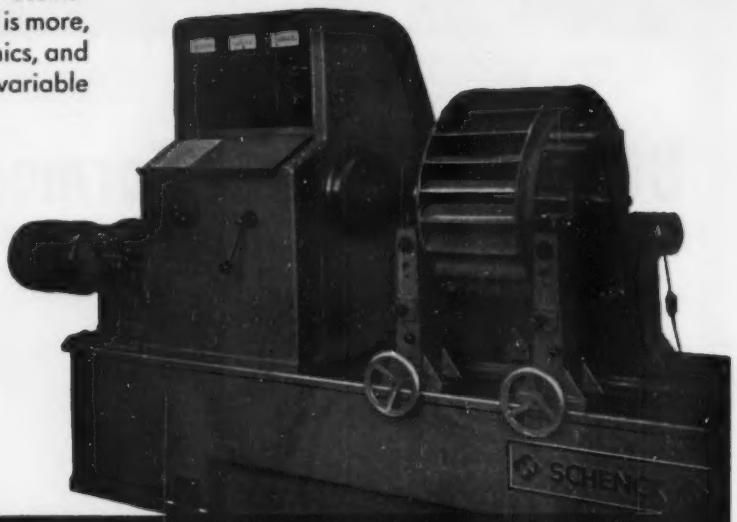
BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Schenck Balancing Machines

System Schenck-Federn

Let the rotor turn, and the wattmeter will show you all the necessary corrections. With this modern measuring principle outlaw oscillations do not affect the indication. What is more, Schenck machines do without electronics, and they are well suited for balancing at variable and high speeds, too.



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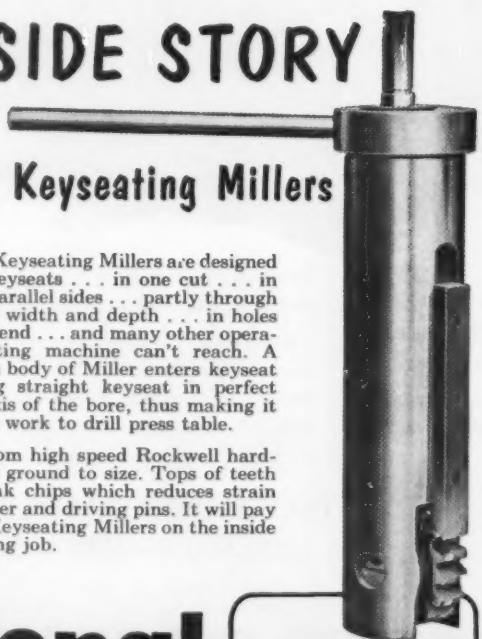
The INSIDE STORY about NATIONAL Keyseating Millers



NATIONAL Keyseating Millers are designed for milling internal keyseats . . . in one cut . . . in offset holes . . . with parallel sides . . . partly through holes . . . of standard width and depth . . . in holes that are closed at one end . . . and many other operations that a keyseating machine can't reach. A demountable guide on body of Miller enters keyseat being milled assuring straight keyseat in perfect alignment with the axis of the bore, thus making it unnecessary to clamp work to drill press table.

CUTTERS are made from high speed Rockwell hardened steel, accurately ground to size. Tops of teeth are staggered to break chips which reduces strain and wear on both cutter and driving pins. It will pay you to put National Keyseating Millers on the inside of your next keyseating job.

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for Catalog No. 17

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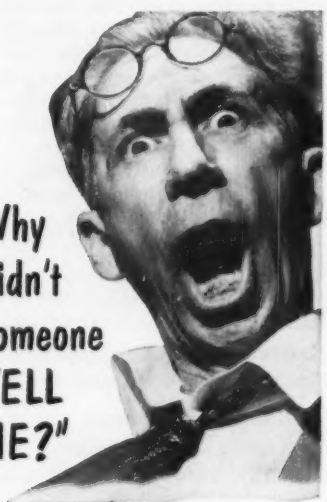

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SMITH WELDING EQUIPMENT CORPORATION

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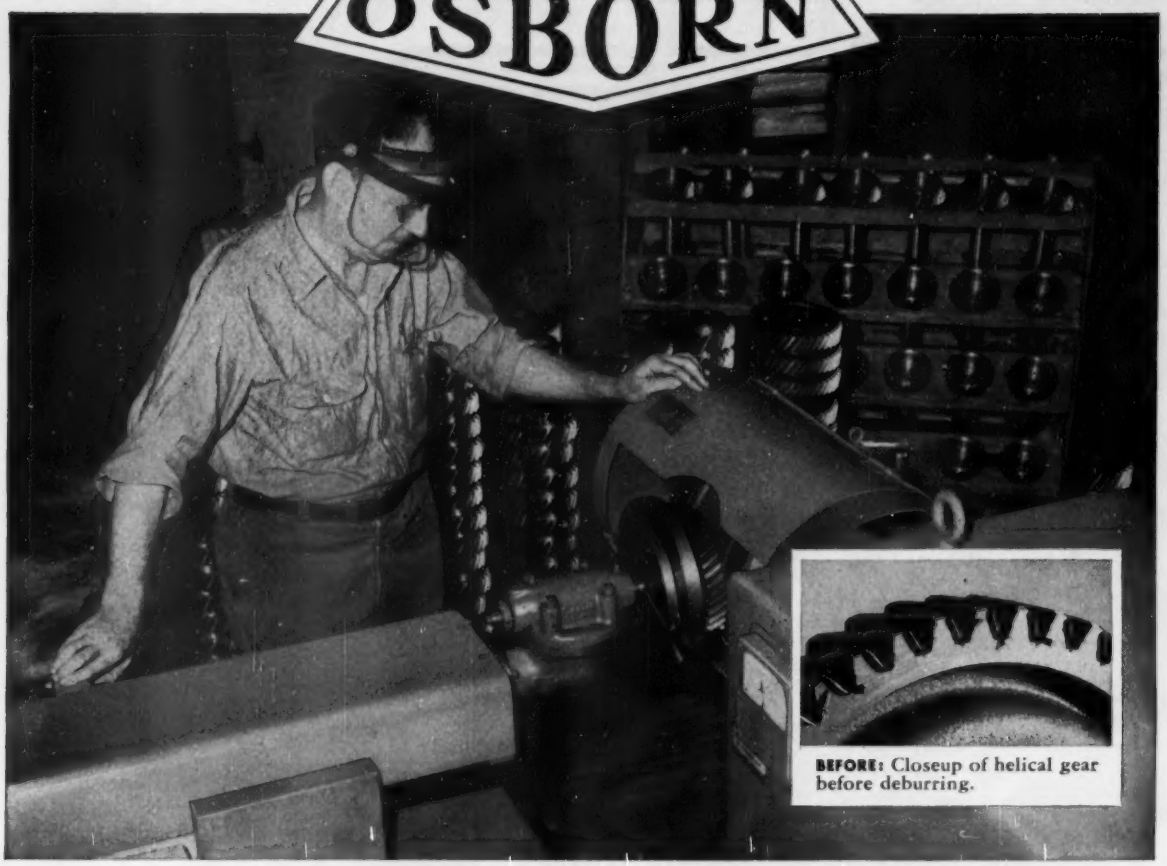
OSBORN



BEFORE: Closeup of helical gear before deburring.

Gone . . . costly thorns in their side

Burr removal by muscle methods is aggravating because it is costly, inefficient and non-uniform in quality. Here's how a truck manufacturer has banished these "thorns in the side" with push-button brushing.

The operation: to deburr, break and blend the flank edges of gear teeth prior to shaving and heat treating. Formerly done with a hand tool, in several operations, the work was tedious and required close inspection and reworking to meet rigid specifications.

Now, an Osborn Brushing Machine in one speedy operation smooths the entire tooth edge . . . produces *uniform blending* of surface junctures of *every tooth*. Result: lower costs and greater precision for *better performance* of the product in service.

Find out how *you* can cut your costs and improve *your* products with power brushing. Call the nearby **O**sborn **B**rushing **A**nalyst or write *The Osborn Manufacturing Company, Dept. C-14, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

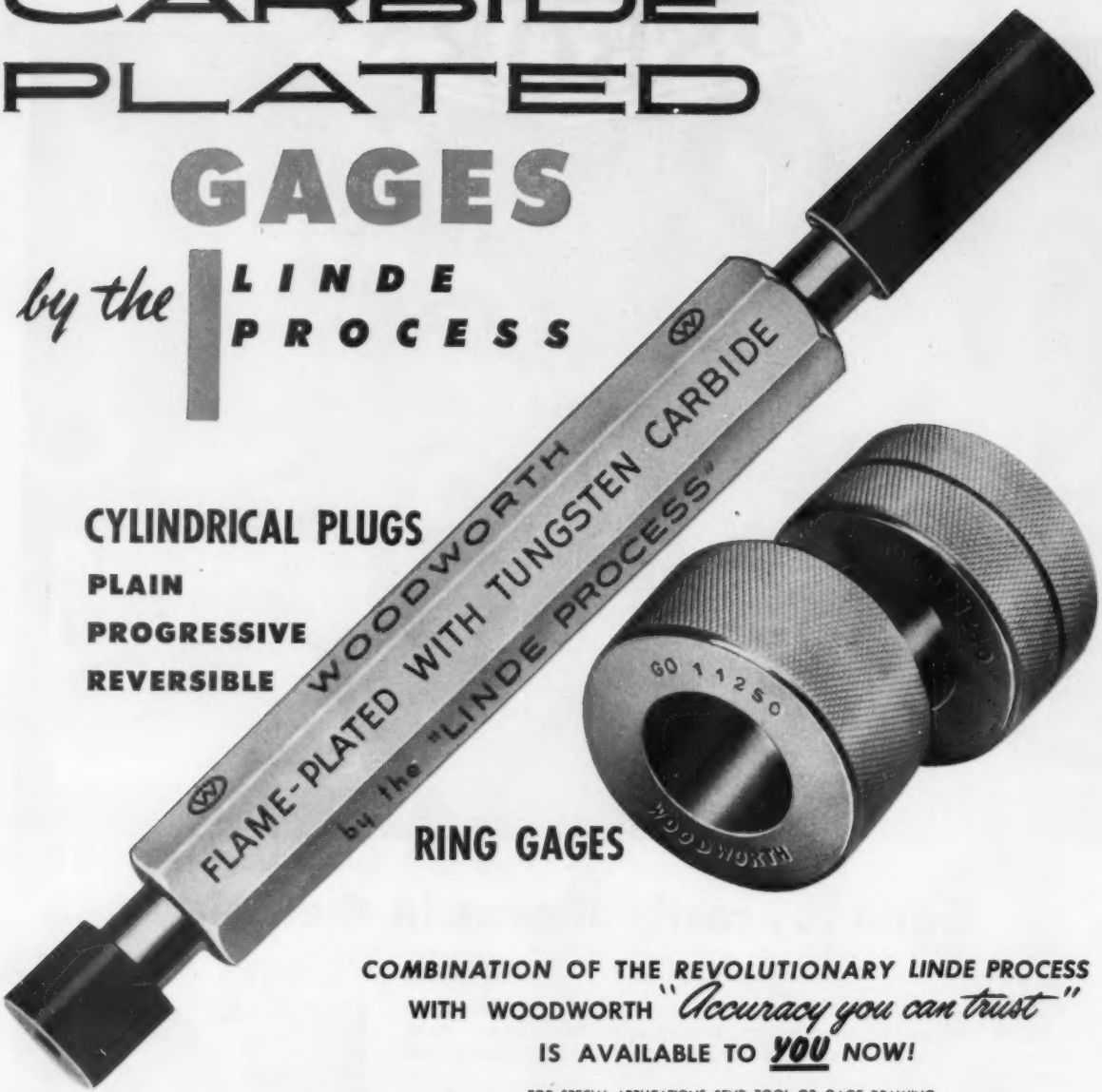
AFTER deburring with Osborn Brushing Machine. New booklet on deburring with Osborn Power Brushing, free on request.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

CARBIDE PLATED GAGES

by the LINDE PROCESS



CYLINDRICAL PLUGS

PLAIN
PROGRESSIVE
REVERSIBLE

RING GAGES

COMBINATION OF THE REVOLUTIONARY LINDE PROCESS WITH WOODWORTH "Accuracy you can trust" IS AVAILABLE TO YOU NOW!

FOR SPECIAL APPLICATIONS SEND TOOL OR GAGE DRAWING.

WOODWORTH HAS ALSO PREPARED AND FINISHED SUCH DIVERSIFIED TOOLS AS—

1. ***THE GAGE FIELD:***
   Flat, Width, Bar, Length, Depth and Contour Gages, Sizing Plugs, and many sizes of Air Gage Spindles.

2. ***THE TOOL FIELD:***
   Grinding and Turning Arbors, Core Rods, Draw Dies, Extruding Punches, and Precision Chuck Jaws.

3. **PRECISION PRODUCTION PARTS.**

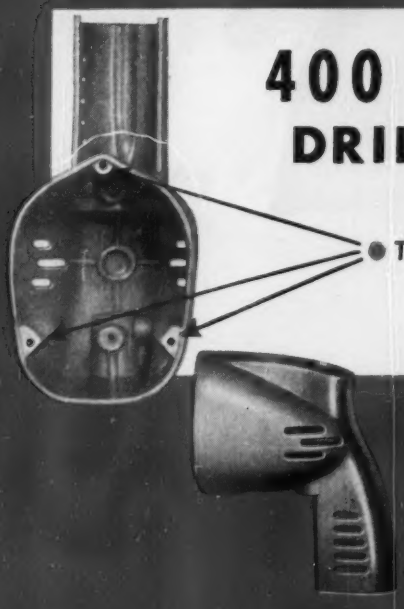
WOODWORTH

1300 EAST NINE MILE ROAD • GAGE DIVISION • DETROIT 20, MICHIGAN

AN A33A NATCO PROVIDES

High Production plus Flexibility

FOR THOSE SMALL PARTS



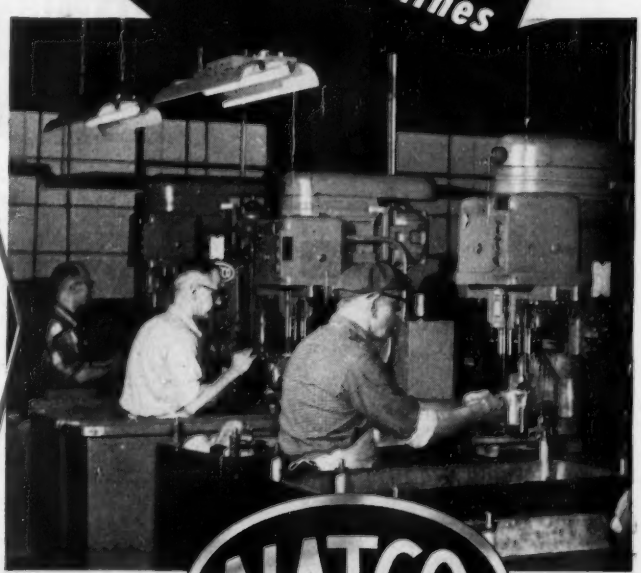
400 SMALL PARTS DRILLED or TAPPED PER HOUR

- THREE .1065 HOLES DRILLED OR TAPPED 6-32 TAP IN HAND DRILL HOUSING

JUST ONE OF MANY PARTS drilled and tapped on these NATCO High-Speed adjustable A33A machines

Another example of light sensitive machines

NATCO ENGINEERED for Quality and Quantity Production



NATCO DRILLING, BORING, FACING AND TAPPING MACHINES

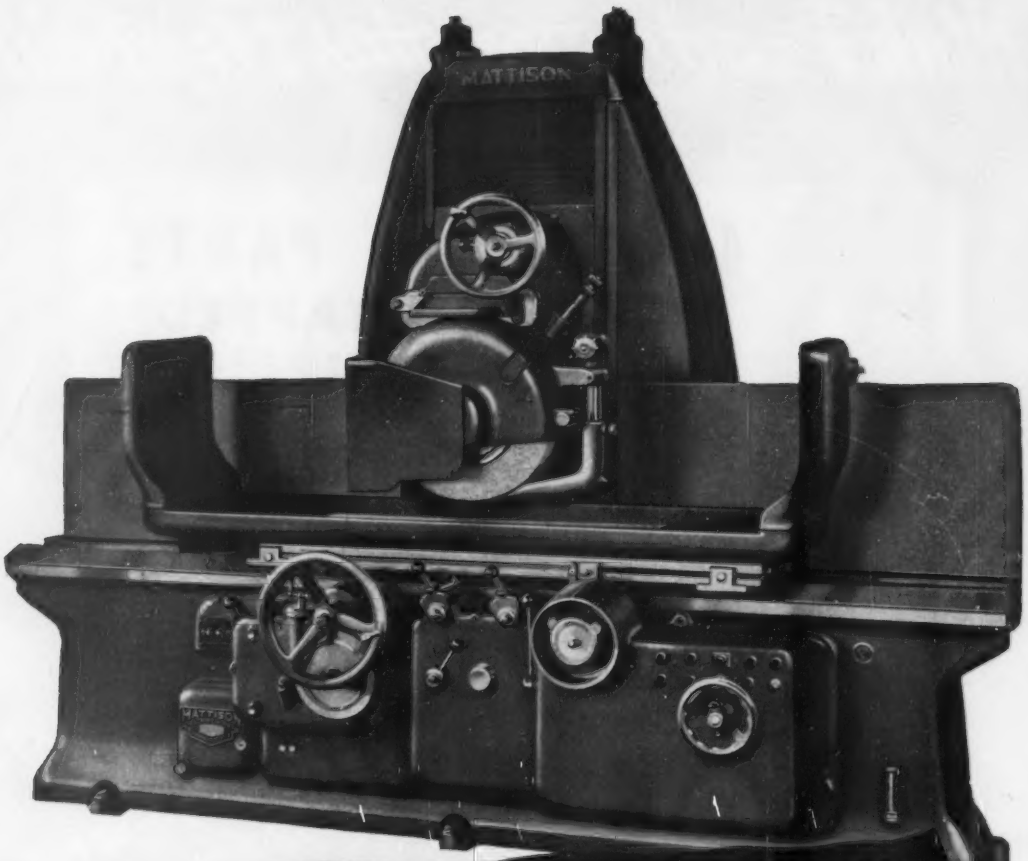
NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Indiana

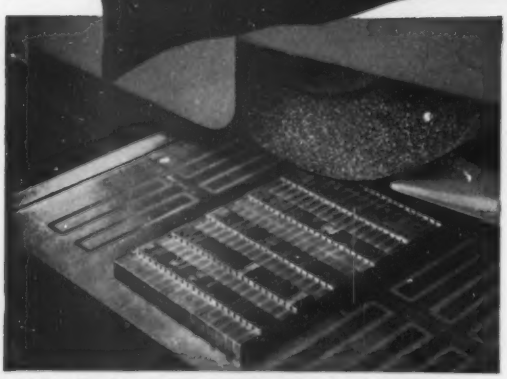
Branch Offices: CHICAGO, 2009 Engineering Bldg. • DETROIT, 409 New Center Bldg.

BUFFALO, 1807 Elmwood Ave. • NEW YORK, 35 Beechwood Ave., Mount Vernon

Call a Natco Field Engineer



HERE'S A CHANGE THAT INCREASED PRODUCTION FROM 30 PER HOUR TO 200 PER HOUR



Both sides of type-stamps are now ground 200 per hour on a Mattison Grinder. Previous production—30 per hour.

● Because of the greater load and grinding area of their Mattison High Powered Precision Surface Grinder, Geo. T. Schmidt, Inc., Chicago, Illinois have been able to effect considerable savings in grinding time over their previous method. As an example—the type stamps shown in the picture above were formerly ground a few pieces at a time on a small grinder—30 per hour. The Mattison Grinder they are now using provides larger table space and a larger grinding wheel together with the necessary power and stability to permit the grinding of more pieces per load at a production rate of 200 per hour. Similar results are obtained on other parts.

Mattison High Powered Precision Surface Grinders have the high power and rugged double-column construction for rapid stock removal and the precision necessary for high quality finish and accuracy to close limits.

This combination not only will enable you to step up production on small parts, but permits grinding large work which previously could not be handled. For further information send for free circular.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

Keeps Coolants Clean AUTOMATICALLY

(to step up production and cut down-time)

THE HOFFMAN

Vacu-matic

for automatic continuous filtering of water soluble coolants from grinders, hones & other machine tools

See it at the Plant Maintenance and Engineering Show January 25-28 Chicago International Amphitheatre

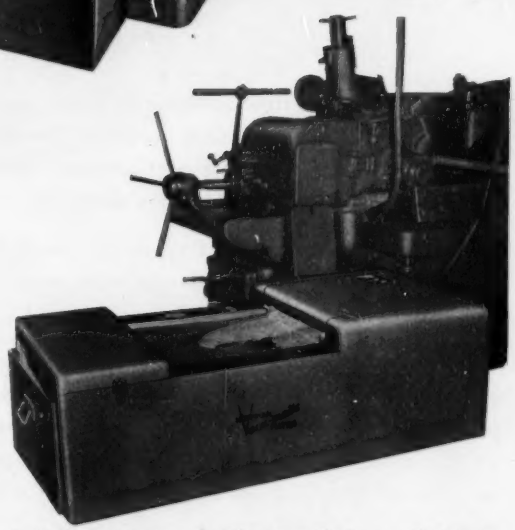
Easily Installed on Present Machines

Two Sizes: 20 and 40 g.p.m.

Write for New Bulletin A-915

The Vacu-matic is your answer to less maintenance and more production with individual machine tools using soluble coolant. It operates without attention—takes dirty coolant, passes it quickly through an endless belt specially woven of nylon, cotton and wool fibers. Then it recirculates clean coolant (at or below room temperatures) back to the tool while dry sludge is automatically vibrated off into a handy tote box for easy disposal.

Your savings on sump-cleaning down-time, wheel replacement and increased productivity will, in short time, pay back your investment in a Vacu-matic.



A Hoffman Vacu-matic Filter installed on a #3 Cincinnati Centerless Grinder. Dirty coolant enters at the right, flows over a moving belt where the coolant is pulled through the belt fabric by a vacuum. Sludge that remains is carried dry to the box shown partially open at the left.

Hoffman INDUSTRIAL FILTRATION DIVISION

INDUSTRIAL FILTRATION EQUIPMENT & ENGINEERING

IN CANADA: Canadian Hoffman Machinery Co. Ltd. Hamilton, Ont.

U. S. HOFFMAN MACHINERY CORP., 241 LAMSON STREET, SYRACUSE 6, N. Y.

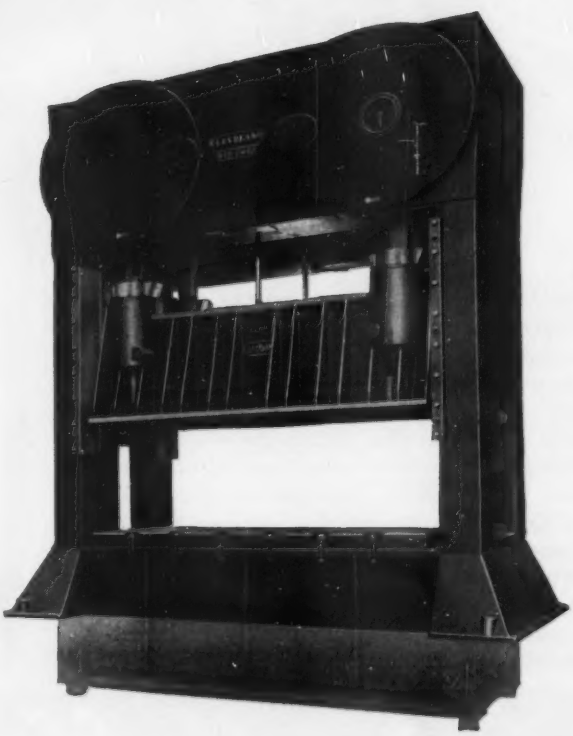
Presses are specialized too!

You'd be wasting time and energy if you tried to drive a spike with a tack hammer. It would be just as wasteful to use a giant Cleveland Four-Point Press to form a single, small stamping.

That's why we make 11 types of Cleveland Presses. Each type is available in a wide range of sizes and capacities.

If you're interested in stepping up production economy, let a Cleveland engineer study your particular needs. Follow his recommendations and you'll get the "right" press for utmost efficiency when you buy a Cleveland. Write or call today!

A-3313



CLEVELAND FOUR POINT PRESS 600-TON CAPACITY—40" stroke, 20" adjustment, 75" shut height, bed and slide area 102 x 204".

THE CLEVELAND PUNCH & SHEAR WORKS CO. U S A

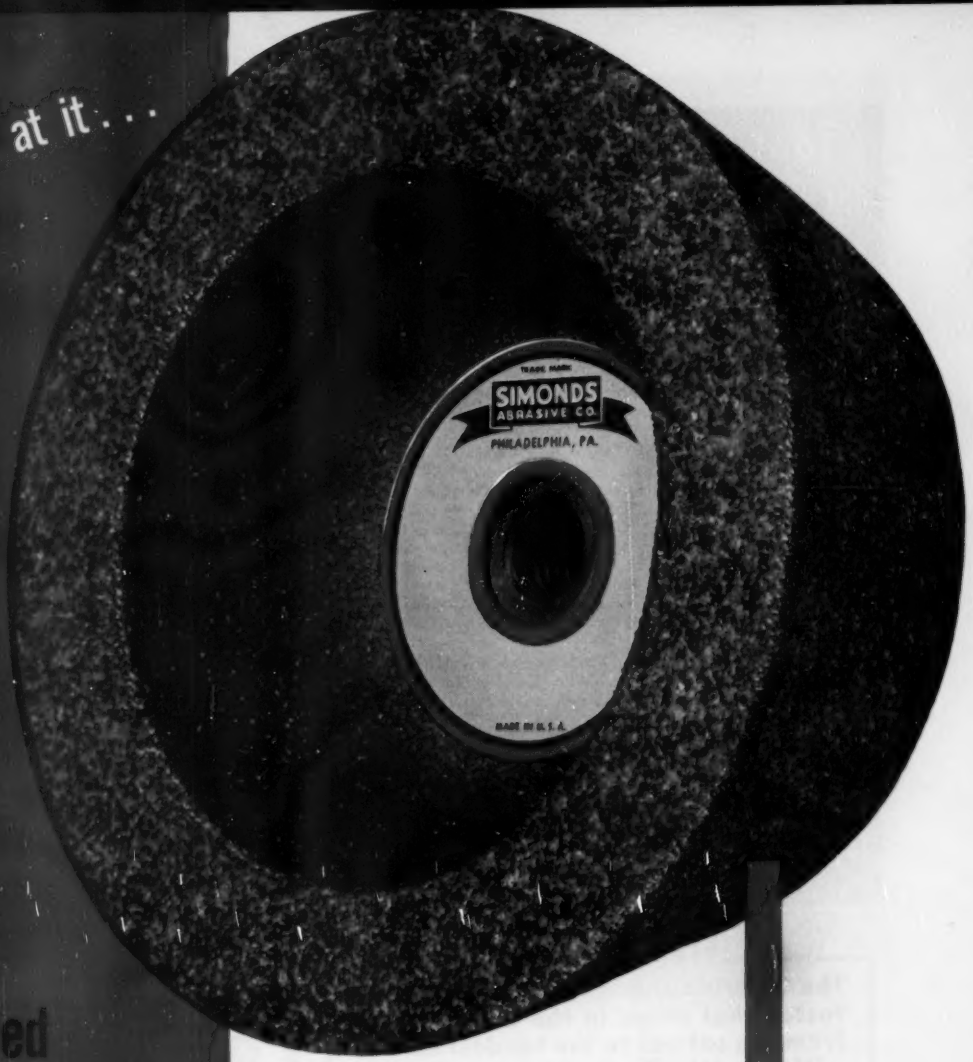
THE CLEVELAND PUNCH & SHEAR WORKS COMPANY

CLEVELAND 14 • OHIO

NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING

any way you look at it . . .

portable grinding is profitable grinding with SIMONDS resinoid bonded grinding wheels



Spot grinding! Smoothing welds! Grinding in corners! Working with odd shapes! Wherever low-cost, top-operating efficiency is essential, Simonds portable wheels fill the bill. They cut fast, hold their shapes, give long service, and include everything you need—straight wheels, cup wheels, cones, pot-balls and blind-end wheels. Resinoid bonded for high speeds up to 9500 s.f.p.m. Write for free folder ESA-62.

Rotor type cup wheel—cross section shows steel bushing flange and safety ring.

SIMONDS
ABRASIVE CO.
PHILADELPHIA 37, PA.

BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, PORTLAND, SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG, MASS. • OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y., SIMONDS CANADA SAW CO., LTD., MONTREAL, QUEBEC AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUEBEC

Tool life greatly increased by reconditioning cutting oil *with*
BARRETT OIL EXTRACTION SYSTEMS

Reports from plants using Barrett Oil Recovery and Reconditioning Systems show surprisingly high percentages in increased tool life. Then, too, users are enthusiastic as to the improved condition of the reclaimed oil as well as the high returns on the investment. Some set-ups in plants engaged on defense production have paid for themselves in a few months.

The Barrett Centrifugal Oil Extractor—which is part of a complete system—recovers 100% of the removable oil or 98½% of the contained oil from chips and turnings in 2 minutes or less. Complete Barrett oil recovery and reconditioning systems include Extraction, Sterilization and Sedimentation, together with filtration. The units involved are available in various sizes, individually or as a group, and are available with full manual control, semi-automatic control or with full automatic control requiring only loading, unloading, starting and stopping of the extractor by the operator. Complete plans including storage tanks for reclaimed oil or for use in conjunction with existing equipment are also available.

With the Barrett system, abrasive-free oil assuring longer tool life can always be depended on. With Barrett Sterilization and Sedimentation equipment, cutting oil is also safe and free from contamination.

Investigate Today by Sending for Descriptive Bulletin of Oil Recovery and Reconditioning Systems

Barrett Centrifugal Oil Extractor — the heart of Barrett Cutting Oil Recovery and Reconditioning Systems.

THE LEON J. BARRETT COMPANY, 1800 Grafton Road, **WORCESTER, MASS.**

Designers and Builders of Centrifugal Machinery

HARDNESS TESTER

The *Scleroscope* is the only hardness tester that takes in the entire range from the softest to the hardest metals without any adjustments.

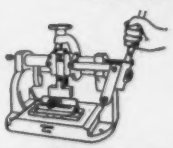
MODEL D-1 DIAL TYPE

Write for Circular!

THE SHORE INSTRUMENT & MANUFACTURING CO., INC.

9035 VAN WYCK AVENUE
JAMAICA, NEW YORK
TELEPHONE: JAMAICA 6-4090

MARK ROUNDS or FLATS



WITH THE MODEL 9A MARKING MACHINE, COMES IN HAND, MOTOR AND AIR DRIVEN MODELS.

If you make precision parts you need the 9A machine.

The ACROMARK Company

7-13 MORRELL ST., ELIZABETH 4, N. J.

LUERS

Patented Cutting Off Tool Holders
Patented Cutting Off Blades

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured By
J. Milton Luers — 12 Pine St. — Mt. Clemens, Mich.

WALTHAM SUB-PRESSES...

. . . for precision work

Arch Sub-Press

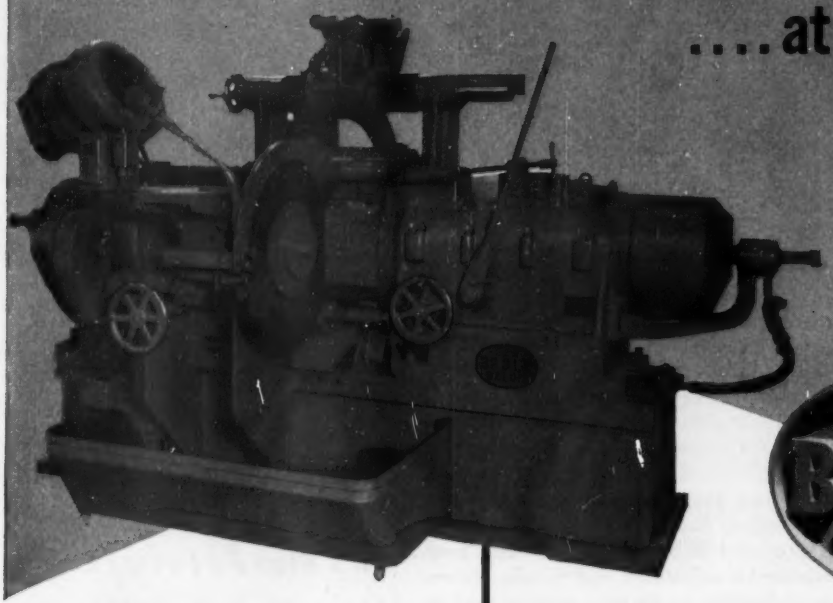
The cylindrical plungers in the Waltham Sub-Presses slide in babbitted bearings. This bearing is tapered on the outside and can be forced downwards, thus reducing the inside diameter to fit the plunger when the latter becomes worn through use. Exact alignment and constant precision can be maintained throughout the life of the die. Write for information about the nine sizes.

Overhang

WALTHAM MACHINE WORKS
HIGH STREET, WALTHAM, MASS.

ACCURACY HELD Within .0002"

for ① SIZE ② FLATNESS ③ PARALLELISM



....at 750 Pieces Per Hour

with this

BESLY

AUTOMATIC FEEDING Gives Precision at Production Rates

Hydraulic pump vanes are automatically hopper fed into a constantly rotating feed wheel, which has a series of openings to receive parts. As the feed wheel revolves, the pump vanes are carried between the parallel faces of the abrasive discs where two sides of the vanes are simultaneously ground. After grinding, the parts are automatically unloaded into a discharge pan.

No. 226 Double Spindle Wet Disc GRINDER

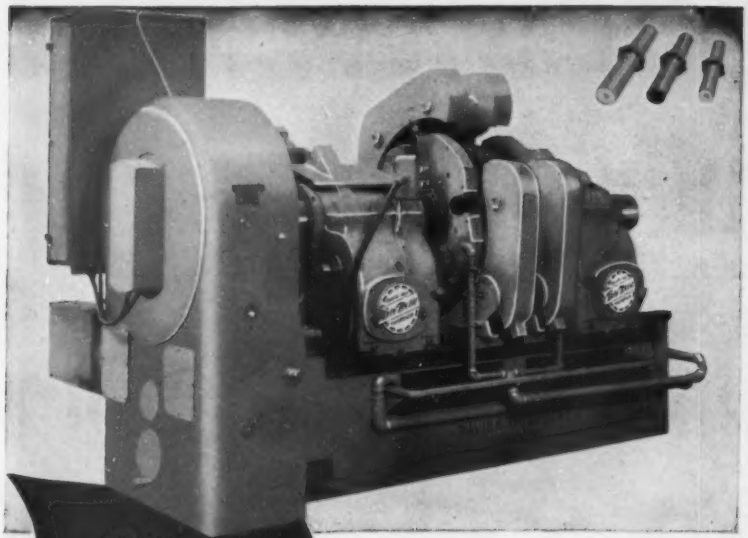
High speed steel pump vanes which are used in the hydraulic pump of an automotive power steering unit are finish ground with this precision grinder . . . and at a rate of 750 pieces or 1500 surfaces an hour. Precision at production rates can be yours, too, because Besly Double Spindle Wet Disc Grinders can be easily adapted to grind many other parallel surfaced parts. Write for full information.

BESLY

BESLY-WELLES CORPORATION

Established as Charles H. Besly & Company in 1875
120 Dearborn Ave., Beloit, Wisconsin

BESLY GRINDERS AND ACCESSORIES • BESLY TAPS, DRILLS, REAMERS • BESLY-TITAN ABRASIVE WHEELS



Milling and Centering Simultaneously and in Continuous Production

Here's an excellent example of how two entirely different operations can be combined on one machine. This Davis and Thompson continuous type Roto-Matic both mills and centers on both ends in one operation. Rough and finish milling cuts on the ends of the shaft and centering of both ends is completed with only one rotation of the fixture drum. The centering heads travel with the work station until centering operation is complete then drop back to next work station and repeat. Automatic equalizing clamping is provided to the fixture. Spindles have micrometric adjustment and spindle carriers are adjustable on the ways to accommodate shafts of various lengths.

FREE DATA on this and other Davis and Thompson machines is available in our bulletin No. 1000.

Roto-Matic

Davis and Thompson Co.

4460 N. 124th ST. MILWAUKEE 16, WISCONSIN

TUBE END FORMING MACHINERY for

Beading — Flaring — Flanging — Expanding — Reducing — Sinking — Swaging — Grooving — Double Lap Flaring and Flanging 1/8" to 4 1/2" TUBING.

Write for General Bulletin G-3

The* VAILL *Engineering Company

137 E. MAIN ST., REAR WATERBURY 20, CONN.

NEW BLADE SOLVES BREAKAGE PROBLEMS

It's Star "*Molyflex*"® High Speed!

A Clemson exclusive.

You'll find it has all the high-speed cutting qualities of the original Star "Moly"® High Speed Power Blades, *plus* being highly break-resistant. Best of all, no premium cost.

Call your Star distributor today for a trial lot of Star "Molyflex" High Speed Power Blades. Rely on him also for hundreds of the other supplies you need regularly and *quickly* to keep your production going.

Sold Only Through Recognized Distributors.

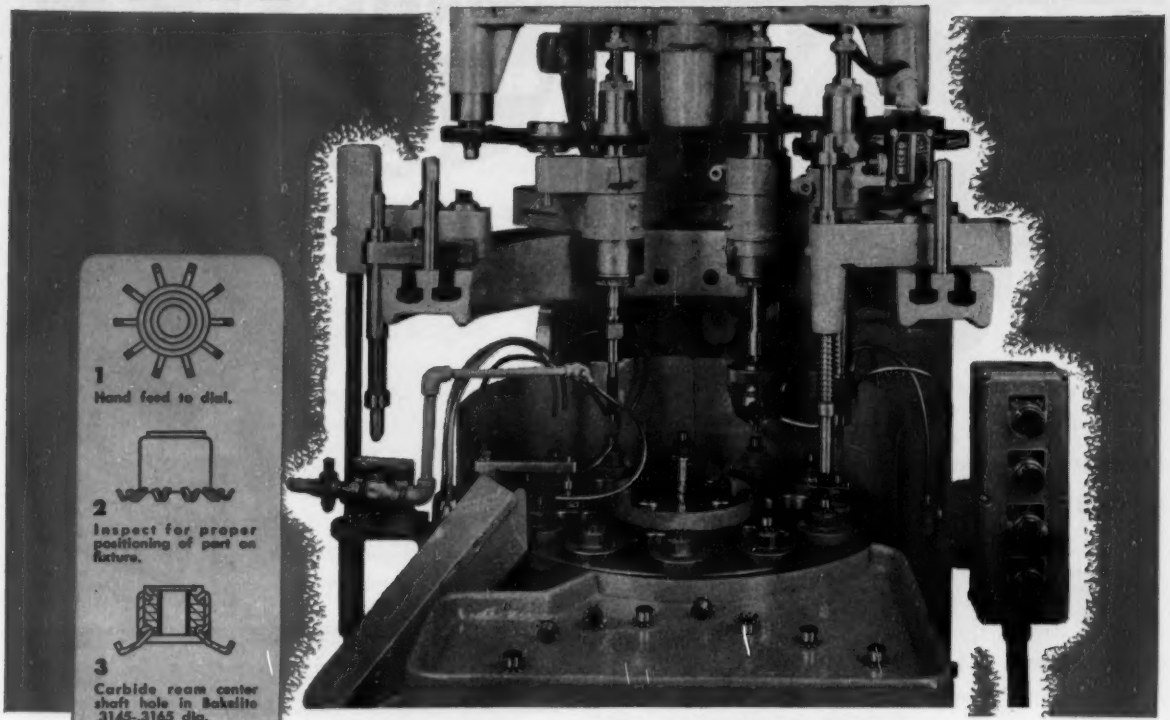
3234

CLEMSON BROS., Inc.

MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Hand and Power Lawn Machines.

Bodine CASE HISTORY NO. 36



1
Hand feed to dial.
2
Inspect for proper positioning of part on fixture.
3
Carbide ream center shaft hole in Bakelite .3145-.3165 dia.
4
Carbide hollow mill on O.D. .691-.693 dia., using piloted hollow mill.
5
Carbide face Bakelite shoulder piloting in reamed hole.
6
Automatically eject.

PROCESSING A COMMUTATOR FOR A SMALL ELECTRIC MOTOR (Copper, molded in Bakelite)

FEATURING . . .

Carbide tools to (1) maintain high production speeds and longer tool life in extremely abrasive materials; (2) maintain close tolerances on machining operations.

PRODUCTION:

1070 pieces per hour at 85% efficiency. Machine used is the Bodine Model 41-20 tooled as a straight driller. This model can be tooled for drilling, tapping, milling, single or double screw inserting, and assembly operations . . . or any grouping desired. If you require high speed production at low costs, this is your machine.

"You Can't Meet Tomorrow's Competition With Yesterday's Machine Tools"

THE Bodine CORPORATION
BRIDGEPORT 5, CONNECTICUT
AUTOMATIC DIAL TYPE DRILLING, MILLING, TAPPING, AND SCREW INSERTING MACHINES

3BD53

"Packaged Precision"

Measures high-precision holes to fractions of .0001", with these advantages—

Ready to go to work—

anywhere—at machine, inspection bench, selective assembly, Comtorplug can be wherever needed—instantly.

any time—hand Comtorplug to the operator and you're in business! No need for preplanning, installation of wires or hose; no headaches of electronic gadgets.

by anybody—in a few minutes any worker gets the knack of Comtorplug—its automatic features assure accuracy, and uniformity regardless of human variations—no training course or experience needed to use Comtorplug precisely.

Prominent in the Jet Engine Program

Any new, fast-moving program appreciates Comtorplug because it's so adaptable, accurate, rugged. Ideal for Statistical Quality Control. Send for details of this unique patented gage.

REQUEST BULLETIN 46

COMTOR CO.
68 FARWELL STREET
WALTHAM 54, MASS.

WILLEY'S TUNGSTEN CARBIDE TOOLS

Willey's—The COMPLETE LINE of cutting tools—made complete in our own factories. Hundreds of standard sizes always in stock.

SPECIAL TOOLS

Excellent service on special tools built to your specifications.

Send us your prints. You will receive prompt acknowledgement, quotation and delivery date.

CATALOG

Mailed on request. Please use your business letterhead.

STANDARD TOOLS

SOLID TUNGSTEN CARBIDE REAMERS

TIPPED TWIST DRILLS

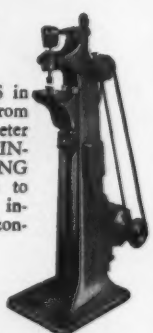
SOLID TUNGSTEN CARBIDE ROUTER BITS

WILLEY'S CARBIDE TOOL CO.
SOLE MAKERS OF WILLEY'S METAL
1342 W. Vernor Highway Detroit 1, Michigan

GRANT

RIVETERS — PIONEERS in their line—head rivets from smallest to ¾" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

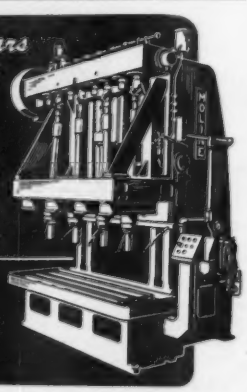
Write for literature and don't forget to send samples.



THE GRANT MFG. & MACHINE CO.
85 Silliman Ave., Bridgeport, Conn., U. S. A.

MOLINE

For Over 50 Years
"HOLE-HOG"
Specially Designed
MACHINE TOOLS
Have Cut Production Costs for American Industry



MOLINE TOOL CO. "HOLE-HOG" MOLINE, ILLINOIS

No. HU68—Hydraulic rail feed universal joint type multiple spindle drilling machine.

We'll SPEND $16.31* to SELL a

$15.00 can of

TRIM

the MASTER CUTTING FLUID

Why? Because we *know* that Trim will reduce costs in your plant. Won't rust, gum or stink! Trim is not just another coolant. That's why we'll spend $16.31 to sell a $15.00 can of Trim for testing in your plant. We *know* that once you try Trim, you'll become a steady user. Write for full information and our new 48 page booklet on cutting and grinding procedures.

*Salesman's Cost-per-call
Average for
87 Industrial Companies
(from American Machinist)

TRIM
MASTER COOLANT

PRODUCT OF
MASTER CHEMICAL CORPORATION
13 HURON STREET • TOLEDO 1, OHIO

NO GETTING AROUND IT!

YOU SAVE MORE THAN the OIL with a DE LAVAL PURIFIER

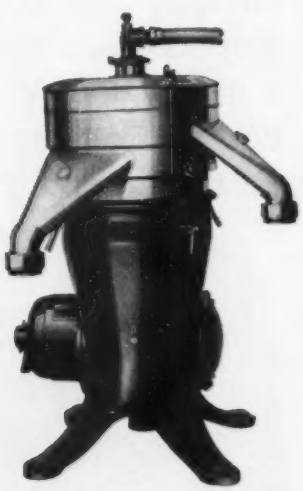
When test oil is kept continuously purified by De Laval Centrifugal Oil Purifiers, testing of machinery of all kinds, from aviation or automotive engines to shock absorbers or transmissions, is safer . . . more reliable . . . more economical.

De Laval Oil Purifiers remove by means of centrifugal force the metallic particles, grit, dirt and water from the oil used in the circulating systems of hydraulic mechanisms, eliminating the danger of scoring delicate parts, even though the oil is used over and over again.

De Laval Oil Purifiers may be used in many other ways to reduce production costs in various types of metalworking plants. One application, for instance, is for the removal of foreign material from cutting oil. Such centrifugal purification makes the oil so clean that higher speeds are possible, tool life is lengthened and wear on machine tool parts is minimized.

There are at least 16 other applications for De Laval machines in a metalworking plant of moderate size.

● Write for the check list MM-1.



THE DE LAVAL SEPARATOR COMPANY
Chicago POUGHKEEPSIE, N.Y. San Francisco

DE LAVAL

PURIFIERS AND CLARIFIERS FOR FACTORY OILS

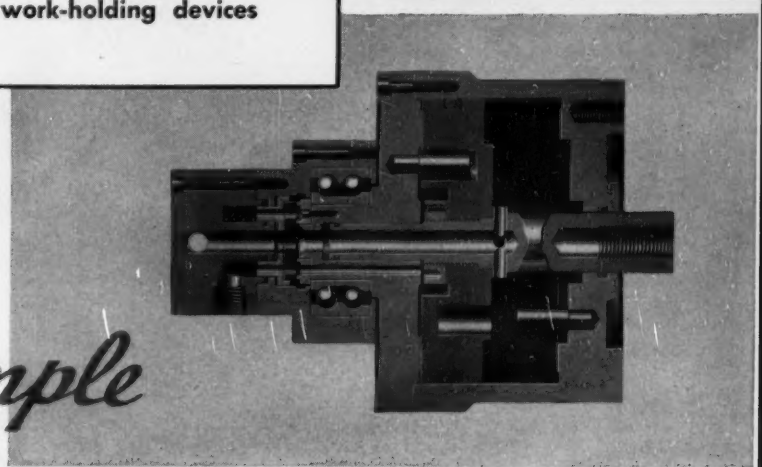
CUSHMAN

gives you CHUCK-ABILITY

CHUCK-ABILITY: **The ability to SPEED your work . . . ELIMINATE fatigue . . . IMPROVE your products . . . and REDUCE your costs . . . through design and selection of the right work-holding devices**

Remember-

You can't machine it economically unless you hold it right



an example

. . . is Cushman's comprehensive series of Aluminum Body Cylinders, guaranteed to operate up to 7000 r.p.m. without vibration and with low fly wheel effect. Available from 3¼" to 14" bore size with a stroke from 1" to 2" depending upon the cylinder size. Iron Body Cylinders, available from 8" to 20" bore size with a stroke from 1⅜" to 2", are designed to operate efficiently at speeds specified for modern standard machine tools. Air Swivel Connections for both types of cylinders are made of aluminum with patented air seal designed to hold applied pressure without variation or leakage throughout a long service life. All cylinders are statically balanced and bench tested to eliminate vibration at rated speeds. While Cushman Rotating Air Cylinders have been designed for use with Cushman Air Operated Chucks, they will perform equally well with air chucks of other makes.

Find out what Chuck-Ability can do for you . . . write Cushman for Catalog No. PO-64-1953 fully describing and illustrating Cushman Air Operated Chucks, Cylinders and Accessory Equipment . . . or, should you have a special work-holding problem, consult the Cushman Engineering Department . . .

THE CUSHMAN CHUCK COMPANY

806 Windsor Street **Hartford 2, Connecticut, U.S.A.**

Manufacturers of

Air Operated Chucks, Cylinders, and Accessory Equipment . . . The Cushman Power Wrench . . . Cushman Manually Operated Chucks and Face Plate Jaws

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CS54

MILLING MACHINE ARBORS, ADAPTERS, ARBOR SPACERS AND BEARINGS

STYLE "B" ARBOR

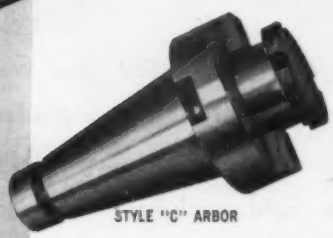
Standard American Dimensions

Tested for Performance

Immediate delivery from New York Stock

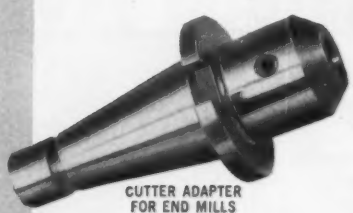
MADE IN GERMANY

Low Competitive Prices



STYLE "C" ARBOR

Hardened and ground to high standards of accuracy and quality by long established, reputable, West German Manufacturer.



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MBI

The LINLEY JIG BORER

Put your small jig boring jobs on this precision machine

Here's a machine, available at extremely low cost, that will enable you to save your larger machines for larger, heavier work. You'll find it meets your most exacting requirements for precision. Get our accuracy information and you'll see what an outstanding investment this machine represents.

Table movement: 6" x 10"; table size, 7" x 17½".

Send TODAY for complete information

LINLEY BROTHERS CO.

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For IDEAS on HOW TO CUT PRODUCTION COSTS with oil-hydraulic equipment

-start with DENISON FIELD ENGINEERS

PLANNING NEW EQUIPMENT? Looking for a new way to meet some specific problem? Then it's time to get the facts on how oil-hydraulics can cut production and maintenance costs wherever you need controlled *power, pressure, or motion.*

Denison Field Engineers, with their wealth of production experience, can give you important advice and information on *plant-proved* HydrOILic installations covering a wide range of needs. Their counsel is absolutely free of obligation.

Denison makes a carefully designed line of oil hydraulic pumps, motors, and pressure and directional controls for circuit needs up to 5000 psi. For production operations requiring accurately controlled pressure, the Denison Multipress offers smooth hydraulic power to cut costs, save time, improve quality, reduce scrap, lower noise level, and make the operator's job safer, simpler, easier. Multipress is available in nine frame sizes . . . one-ton to 75-ton capacities, and with controls, automatic feeds, index tables and other accessories for a variety of requirements. Your Denison Field Engineer has the complete story — or drop us a line, we'll gladly send along descriptive information.

DENISON HydrOILics

PUMPS | MOTORS | CONTROLS | PRESSES

The DENISON Engineering Co.

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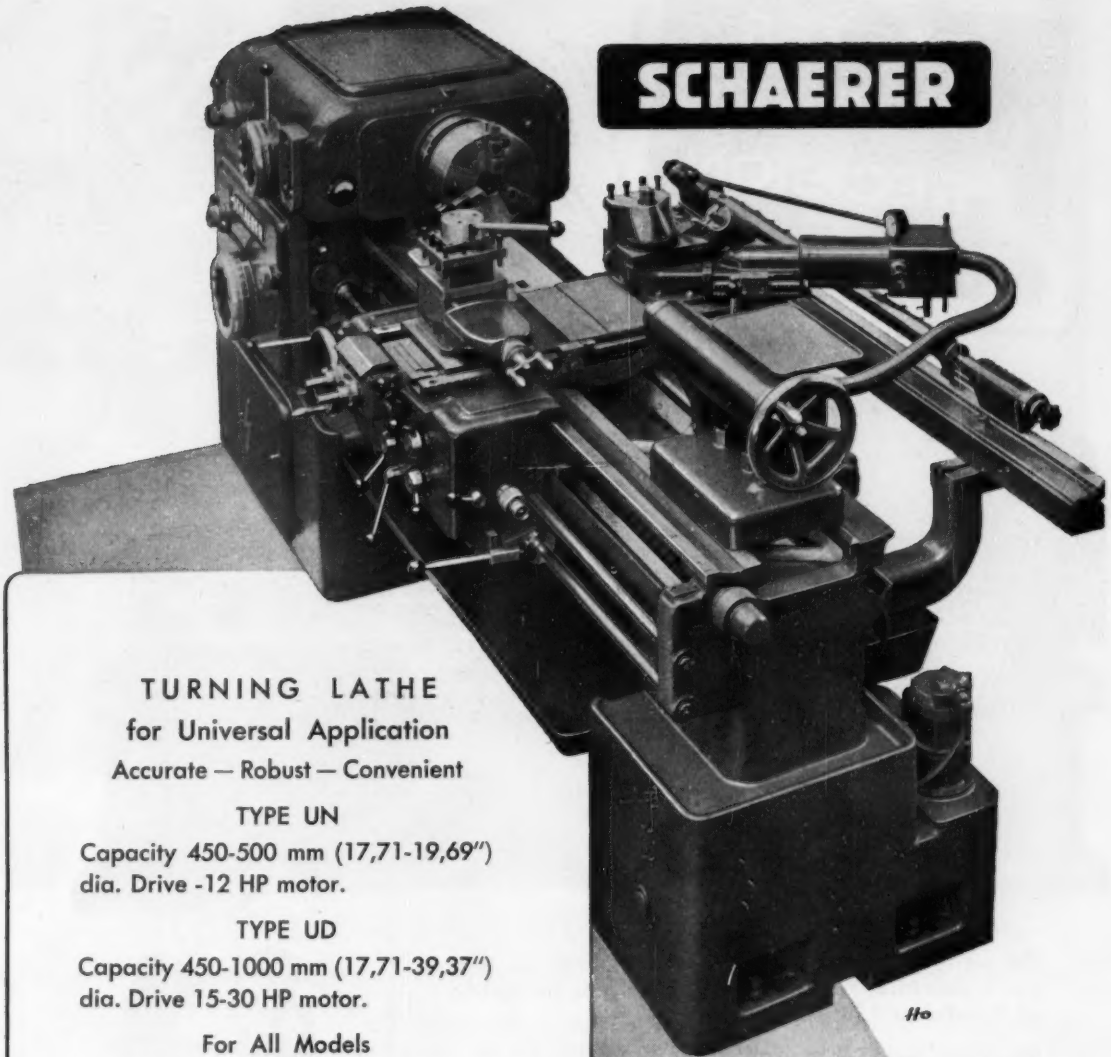

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for Universal Application
Accurate — Robust — Convenient

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Capacity 450-500 mm (17,71-19,69")
dia. Drive -12 HP motor.

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Capacity 450-1000 mm (17,71-39,37")
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For All Models
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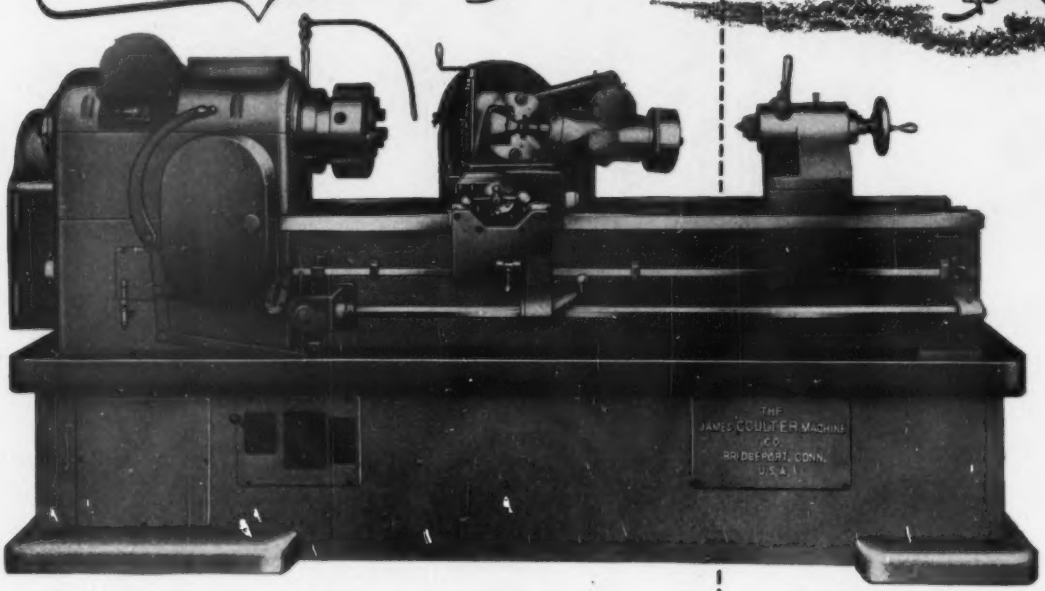
FASTER AUTOMATIC PRECISION THREADING

The only answer to high cost production blues!



Get set to sing a happy tune, for **COULTER** can help you banish those *"labor shortage/reject/poor production of threaded part/blues"*.

The **COULTER** "Threadmaster" (shown above) is one thread milling machine that can produce long and short precision traversing, elevating, crossfeed and lead screws in less time with uncanny accuracy.

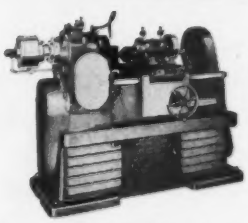
Investigate **COULTER AUTOMATIC THREADING MACHINES** today — change the "blues" to "cheers" — extract *every cent of profit* possible out of your plant and still maintain the high quality standards you demand.

***IF YOU ARE CONFRONTED** with a thread production problem, our engineers can help you. Literature available.*

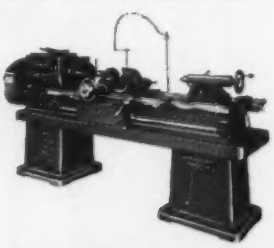
MACHINE TOOL BUILDERS SINCE 1896

The James Coulter Machine Co.

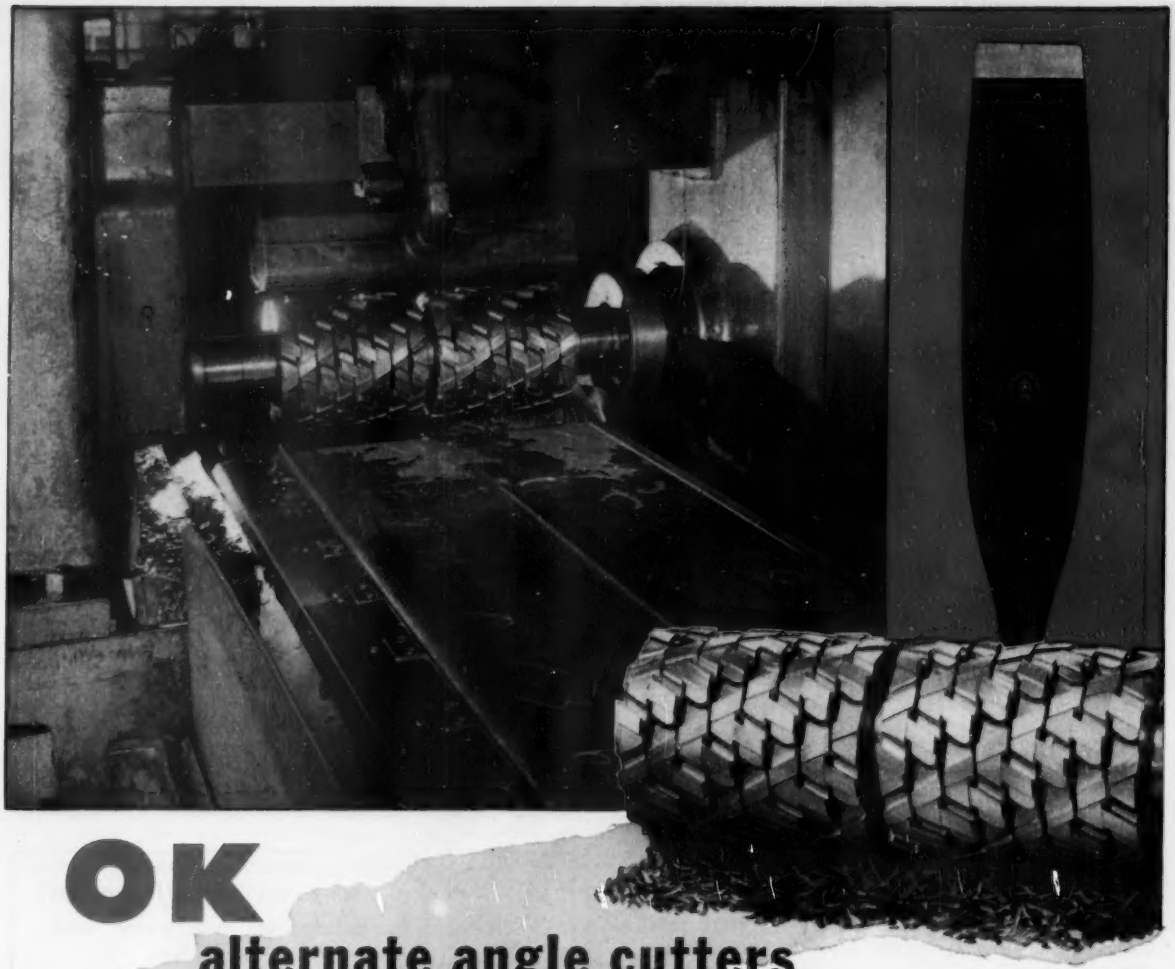
635 Railroad Ave. **Bridgeport 5, Conn.**



Model "H1" COULTER HOB THREADING MACHINE produces internal, external, right and left hand threads with precision — Faster — Accurately — AUTOMATICALLY.



Model "L1" COULTER THREADING LATHE produces precision, square, standard and 29 degree internal or external threads in various diameters and materials — Faster — Accurately — AUTOMATICALLY.



OK
alternate angle cutters
slab-mill tough chrome-nickel-moly prop blades at Curtiss-Wright

JOB DATA

FEED *8.25 inches per minute*

SPEED *30 revolutions per minute*

DEPTH OF CUT *from 0.055 to 0.10 inches*

LENGTH OF CUT *123 inches*

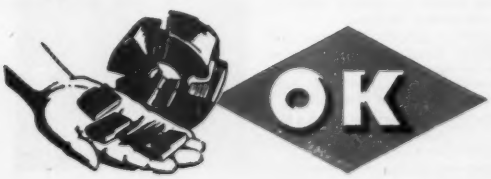
STEEL *Chrome-Nickel-Molybdenum alloy*

CUTTERS *16 mounted 8 and 8 for straddle milling*

Climb-milling the taper on 25x123x.800" chrome-nickel-molybdenum steel plates for the famous hollow-steel propeller blades used on big B-36 International Bombers is regarded as one of the more rugged metal-cutting assignments at the Curtiss-Wright Caldwell plant.

For this second operation, 16 OK alternate angle cutters straddle the center rib of the blade, 8 and 8, are mounted on a 75 hp planer-type miller. The taper extends 123" increasing from 0.055 to 0.10". The cutters are standard OK alternate angle mills with overlapping high speed steel blades. The angular set gives a shearing action, coiling and turning the chips away from the cut. Streamline in design, OK cutters are free from pins, screws, gibs and locks. They pack huskier blades for heavy cuts and more blades per body for finishing cuts. Blades are secured by a driving fit. Mated serrations in body and blades prevent any lateral movement and provide a fine scale adjustment to compensate for wear.

A copy of the OK catalog 13, "Modern Milling Cutters for Modern Milling Machines" is yours on request.

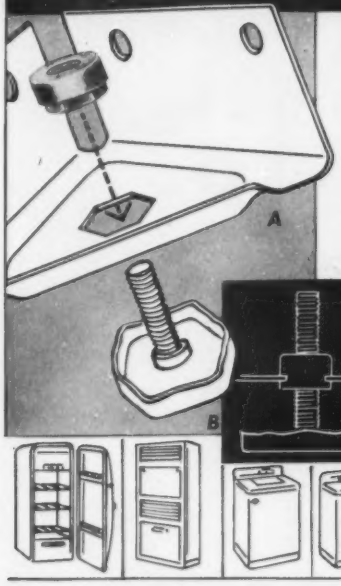


modern milling cutters for modern milling machines

THE OK TOOL COMPANY, INC., Milford, New Hampshire

how appliance manufacturers use

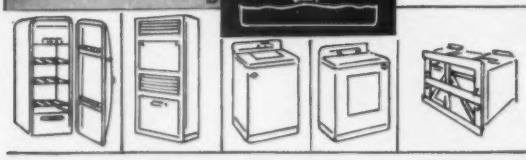
GRIPCO "CLINCH" NUTS IN "BLIND" ASSEMBLIES



for "fixed" fastening
This is the way leading manufacturers get fasteners into inaccessible places.

A—Inner View. GRIPCO "Clinch" Nut ready to insert into hexagonal hole in metal. Shows "pilot" and hex hole before clinching.

B—Cross-Section view after pilot has been clinched and bolt inserted. Can be locked at any point. (Non-locking nut can be supplied if preferred).



Makers of washers . . . dryers . . . refrigerators . . . ranges . . . freezers . . . room air conditioners and many other appliances are enthusiastic over these new and better fasteners—Gripco "Clinch" Nuts. In many cases they do a double job—*first*, to hold the product rigid and safe in its container during shipment, with no risk of bolts "backing out"—and *second*, for holding the adjustable "levelers" after the appliance is delivered to the user. If you have any application with hard-to-get-at fastening or that needs additional threading depth for applying bolts to thin metals, investigate Gripco "Clinch" Nuts.

Where Welding is Available — You may prefer to use

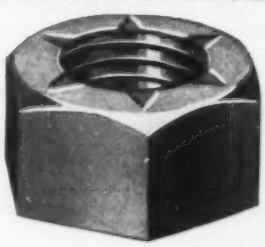
GRIPCO Pilot Projection Weld Nuts Circular pilot accurately positions nut in the bolt hole, for resistance welding. No jigs necessary. Two pilot heights for different gages of metal.

or GRIPCO Countersink Weld Nuts The special countersink feature eliminates the possibility of hot metal particles lodging in the threads; thus no retapping is necessary.

6-POINT SECURITY AGAINST FASTENER FAILURE

GRIPCO LOCK NUTS

1—Firmly lock on to bolt at any position.
2—"Stay put" on bolt, in spite of vibration, tension, etc.
3—Positive locking action not due to any outside devices, but result of simple vertical thread deflection.
4—Oil or water do not affect Gripco locking action.
5—Can be removed with a wrench and reapplied repeatedly without loss of locking action.
6—Cost less because of simple design.



Write for samples, mentioning types and sizes of nuts you use. 480

GRIPCO **GRIP NUT COMPANY**
310-C S. Michigan Ave., Chicago 4, Ill.

KEYSEATING
The Modern Way

Illustration shows typical set-up for cutting taper keyways with table tilted.

Machines are made in three sizes for keyways 1/16" to 1" in width.

Great simplicity and ease of operation of Davis Keyseater, assure the user of accurate, time saving work.

Let our engineer study your keyseating problems.

DAVIS KEYSEATER COMPANY
403 EXCHANGE ST. ROCHESTER, N. Y.

You can save money by investing in modern metalworking production machinery and equipment.

How you can cut costs, speed production, and boost quality in your plant is covered in complete detail in your

1954 PRODUCTION PLANBOOK for Metalworking

MICRO-HEIGHT GAUGE

for fast, accurate layout

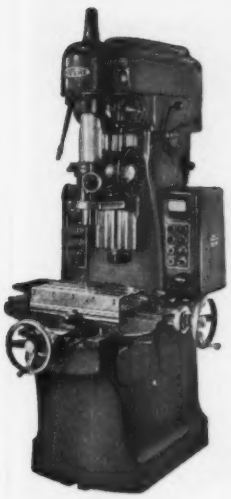
WRITE FOR CIRCULAR AND PRICES

A new precision height gauge which reads like a micrometer and measures zero flush at base. Has a direct reading of 2" with scriber in upright position, and 3" with scriber reversed.

Replace scriber with dial indicator and Micro-Height Gauge measures center distances between holes or surfaces. As indispensable as a micrometer to toolmakers, layout men, and inspectors.

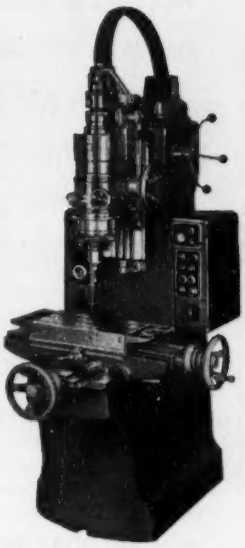
FAIRFIELD GAUGE COMPANY
172 HERBERT STREET
BRIDGEPORT 4, CONNECTICUT

NOW IS THE TIME TO PLAN AHEAD

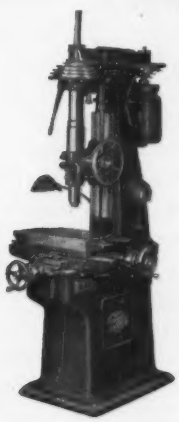


No. 2 MOORE JIG BORER, with its accurate lead screw settings within .0001", offers all the time-proven precision features associated with Moore Jig Borer construction for 15 years, plus numerous labor-saving advantages, including: increased capacity and size; infinitely variable spindle speeds; 3 power feed ratios; centralized controls.

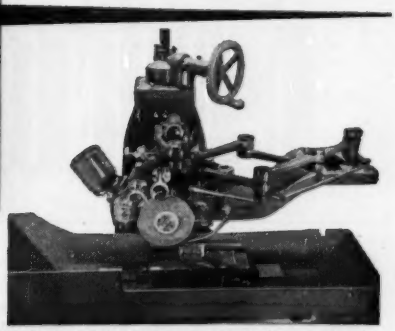
No. 2 MOORE JIG GRINDER. With this new and larger Moore Jig Grinder, *regular and irregular contours* are ground to size and location after hardening. This extends the Jig Grinder's traditional function of relocating straight and tapered holes. Holes from 1/64" to 8" can be relocated and ground within .0001"—by power or hand feed.



Four ways to cut costs and meet competition by mechanizing your toolroom.



No. 1 MOORE JIG BORER remains in the line. For its range—table working surface of 10" by 16" and cuts up to 3½"—this machine is still an ideal buy. There are over 1000 satisfied users. We will continue to offer it for the many situations where a small, accurate jig borer fills the required prescription.



MOORE PANTO-CRUSH WHEEL DRESSER speeds form-grinding and cuts costs. Both crush-forming and diamond-dressing are accomplished with this 2-in-1 unit permanently mounted on the wheel spindle of a surface grinder. You switch from one method to the other without disturbing workpiece setting.

We'll be glad to send you complete descriptive literature on any of these machines.

MOORE SPECIAL TOOL COMPANY, INC.
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ADD MOORE TOOLS TO YOUR TOOLROOM

JIG BORERS · JIG GRINDERS · PANTO-CRUSH WHEEL DRESSERS DIE FLIPPERS · MOTORIZED CENTERS · HOLE LOCATION ACCESSORIES

FULMER

HONING MACHINES
15 sizes, diameters from 1/4" to 30" with strokes from 12" to 84"

METALS ARE CUT AWAY FROM ANY INTERNAL BORE with amazing speed and precision

Chips are often as long as six inches—which gives you an idea of the remarkable speed . . . and at the same time you are assured of internal bores of precision.

Tolerances as close as .0001 (±) for ferrous and non-ferrous metals, glass, plastic, etc. Only rough boring or drilling is needed before honing.

For cylinder blocks, connecting rods, blind end cylinders, 4-way valves and other work.

WRITE TODAY FOR COPY of bulletin on honing

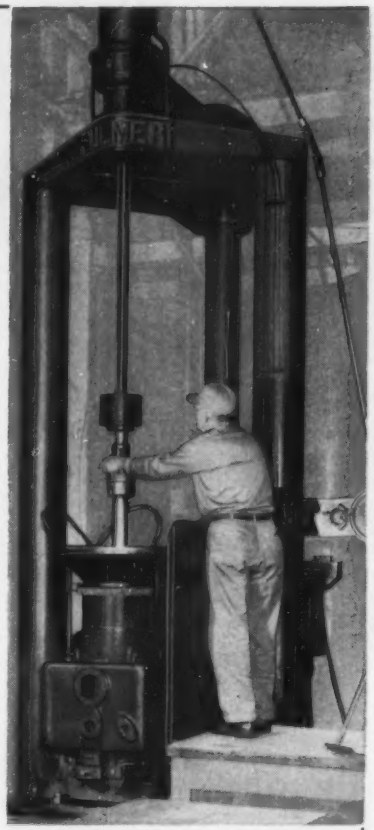

Photo taken in Continental Gin Co., Birmingham, Ala., honing Diesel cylinders.

C. ALLEN FULMER CO.

105 East Fourth St. Cincinnati 2, Ohio

IMPORTANT NOTICE

The Genuine MAUSER **VERNIER CALIPER**

IS NOW MADE OF **STAINLESS STEEL** THROUGHOUT

AND THE FOLLOWING IMPROVEMENTS HAVE BEEN ADDED
- HARDENED PHOSPHOR-BRONZE adjustable gib retains accuracy
- SPECIALLY LONG VERNIER to read thousandths
- 3 GRADUATIONS - 1/1000" - 1/128" 1/10 mm in back

$14.75 PPD

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HIGH SPEED or CARBIDE

FACING TOOLS

For MASS PRODUCTION

FOR HOLES FROM 1/16" UPWARD
17 DIFFERENT SIZES
Write For Complete Data

- CONSTANT CLEARANCE
- CONSTANT SHAPE OF CROSS SECTION
- EASY RESHARPENING
- CONVENIENT TO USE
- LONG LIFE

Dealers! Here's a Profit-Maker!

COMET Tool Co.

738-AM BROADWAY, NEW YORK 3, N. Y.

New Dieing Machine Accomplishes Job 15 Times Faster!

Ford, using one of the largest dieing machines currently installed, produces headlamp cases 1500% faster than was possible previously with a line of single-station presses. You will find thousands of actual facts about how modern metalworking machinery of every type is saving companies money through increased productivity, higher quality, lower maintenance, lower labor costs, less waste, and other important advantages . . . in your 1954 PRODUCTION PLANBOOK for Metalworking.

The new PLANBOOK was published in November as part of your regular *American Machinist* subscription. Besides hundreds of real case histories of successful replacement programs from metalworking plants in the U.S., it features a brand-new Inventory of Metalworking Production Equipment, with details of *how much* metalworking machinery and equipment is in use, *where* it is, and *how old* it is. Here, in one issue, is more money-saving data on metalworking production equipment than you could possibly obtain from any other single source!

The PRODUCTION PLANBOOK for Metalworking

is published every November by

American Machinist

Announcing....

a New addition to our popular line of SELECTIVE FEEDING DEVICES

NOW! A FEEDING UNIT FOR ALMOST ANY SPECIFIC APPLICATION!

Also EXTENDED ENGINEERING SERVICE—

ENABLING US TO DO THE COMPLETE TOOLING FOR YOUR INDIVIDUAL FEEDING OPERATIONS

New!

DPS BOWL-FEEDER

A proved method based on the VIBRATORY PRINCIPLE. Provides fully automatic, oriented, single line feeding to Grinding, Packaging, Inspecting and many other automatic machines and operations. Will scientifically feed light, fragile parts that normally could not withstand tumbling.

DPS BARREL-FEEDER

For years our popular unit, successfully used in thousands of plants to help speed production and reduce costs. They were designed with the idea of simplicity in operation and maximum feeding, handling a wide variety of parts. Designed for constant operation.

Write Us—Give Details and learn how our trained engineers can supply the answer to your feeding requirements.

DETROIT POWER SCREWDRIVER CO.

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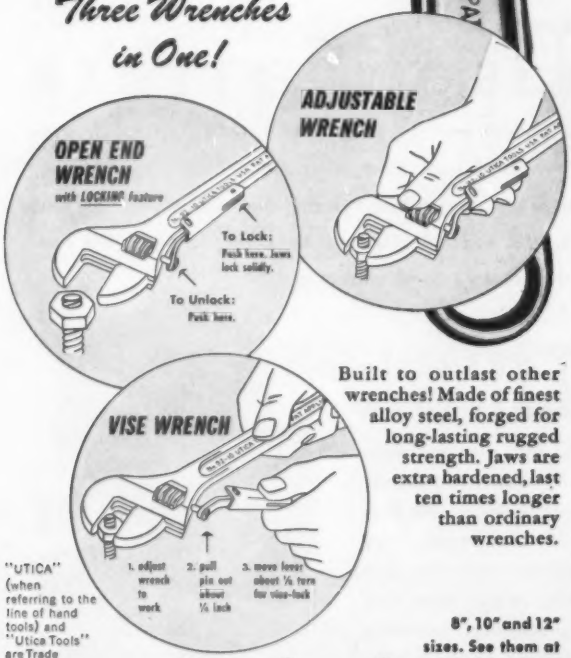
brand new- UTICA No. 92

ADJUSTABLE WRENCH that Locks

MOST amazing new hand tool in years! The UTICA No. 92™ Locking Wrench can be used as an ordinary adjustable wrench. In addition, jaws can be *locked* at any desired setting. But that's only part – jaws also can be made to clamp like a vise ...grip with over 100-lb. pressure. Here's a whole kit of tools in one wrench!

Three Wrenches in One!



Built to outlast other wrenches! Made of finest alloy steel, forged for long-lasting rugged strength. Jaws are extra hardened, last ten times longer than ordinary wrenches.

8", 10" and 12" sizes. See them at your dealer's.

"UTICA" (when referring to the line of hand tools) and "Utica Tools" are Trade Marks Reg. U. S. Pat. Off.

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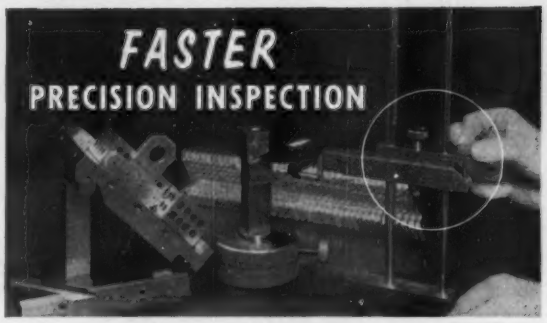
DROP FORGE AND TOOL CORPORATION

UTICA 4 NEW YORK



TTCO INDICATOR HEIGHT GAGE

Inspectors—toolmakers—save time and money. Get faster, more accurate inspection with the new, versatile Tietzmann Indicator Height Gage. Positive final adjustments in millionths easily and quickly made with one hand. No more eyestrain doing scribing work. Supplied with indicator holder and scribing attachment in three sizes.

Adjustable inspection block eliminates trial and error readings of the height gage. Adjustable in millionths through a range of .250" vertically. 1¾" anvil quickly raised and lowered with a micrometer thread screw.

Use both products together for accurate production inspection. Write for Bulletins 140 and 150.

TIETZMANN TOOL CORPORATION

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...this FREE catalog

Write today for this PRESS-RITE catalog showing the complete line of presses with capacities from 5 to 85 tons. Ask for bulletin P552. It's FREE!

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There are thousands of valuable facts and figures about real savings made with new machinery and equipment in your

1954 PRODUCTION PLANBOOK for Metalworking

W.H.O.* SAYS:

"Don't have FITS over FASTENERS, have fasteners that fit."

For the finest in milled-from-the-bar cap screws—set screws coupling bolts and milled studs

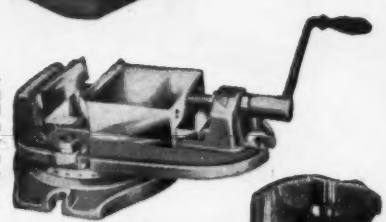
don't get stuck—stick to the ones made by

*Wm. H. Ottemiller Co. YORK, PENNA.

The only way to meet 1954 production needs is on 1954 MACHINES.....

MILLING MACHINE VISE

This improved vise provides greater gripping power, is streamlined for appearance, has a large diameter screw for rigid holding and a coolant trough. Made in two sizes: 5" x 3½" and 6" x 5" jaw openings.



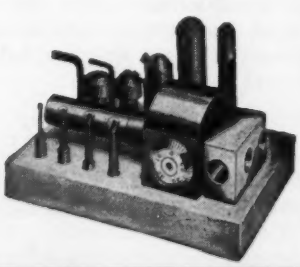
RIGHT ANGLE ATTACHMENTS

Left: Heavy Duty . . . for milling and drilling at right angles. Available for both Master and 1 HP Bridgeport Heads.

Right: Light Duty . . . for right angle milling and drilling narrow, deep molds and cavities.

No. 2 BORING HEAD

Boring Tools and Holder provide the means for boring holes up to 6" diameter. Available for use on Bridgeport 1 HP Milling, Drilling and Boring Attachment.



Bridgeport

TURRET MILLING MACHINES *provide for all* TODAY'S REQUIREMENTS

Production problems of all kinds are being met and solved through the speed, low cost, accuracy and convenience of "BRIDGEPORTS". These machines offer the exclusive feature of being able to mill, drill, bore and shape, combined with ability to position the milling head at all angles over a wide area, *without changing set up.*

The year just passed has seen more than 2500 Bridgeport Milling Machines shipped to shops interested in making worthwhile improvements in their production. These shops appreciate the value of modernization made possible through the use of machines which in many respects are way ahead of their time in performance and end results . . . machines that are not only "1954 machine tools" but which will still be modern for many years to come.

Ask your dealer . . . or us . . . to show you how you can make the "BRIDGEPORT" a worthwhile investment for 1954 and for years ahead.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

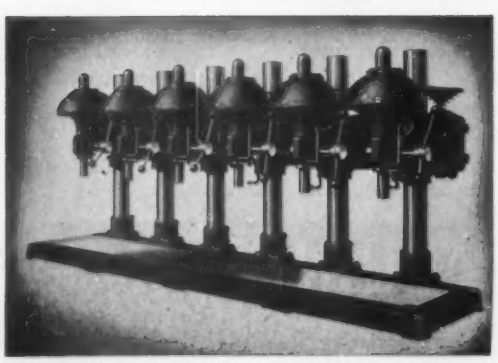
STAMINA FOR BONUS YEARS OF PRODUCTIVITY

"Buffalo" No. 18 Pedestal Model Drill with foot feed. Operator has both hands free.

. . . YOURS IN THE SHOP-PROVEN "BUFFALO" NO. 18 DRILL

Its heavy-duty, precision-machined spindle runs smooth and true on ball bearings . . . free of end play . . . designed and built to stand the endless punishment of high-production work. Its feed controls are intelligently placed for minimum fatigue during long runs. Setup adjustments are easily and speedily made by convenient cranks. And you can get this workhorse drill in a choice of 12 models, in 1 to 6-spindle bench or pedestal units to suit your exact requirements. Drilling capacity, up to 1" in cast iron.

Here is a machine that is bound to hike your output, improve accuracy and reduce repairs and obsolescence to the bone. Think of the profits it could be making for your shop . . . right now! Why not write for Bulletin 3123 and investigate it further?



"Buffalo" No. 18 Drills are available in as many as 6 spindles for operation with several setups on a production line.

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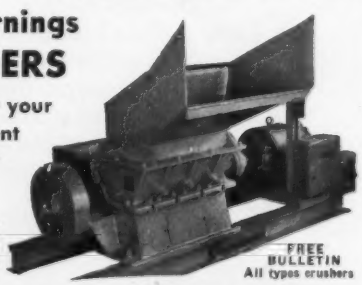

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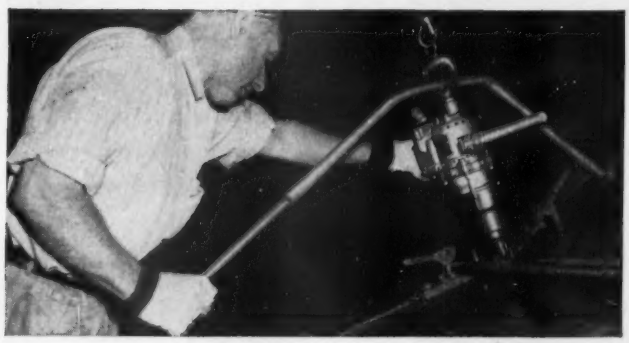

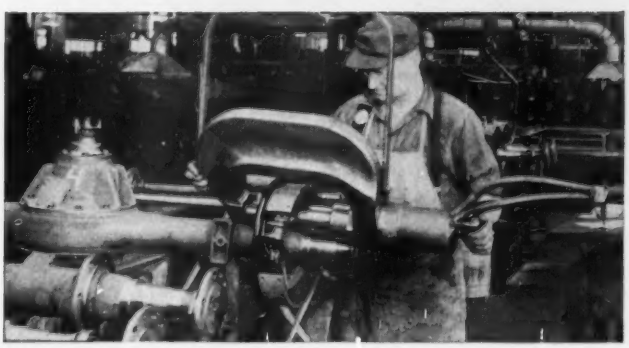

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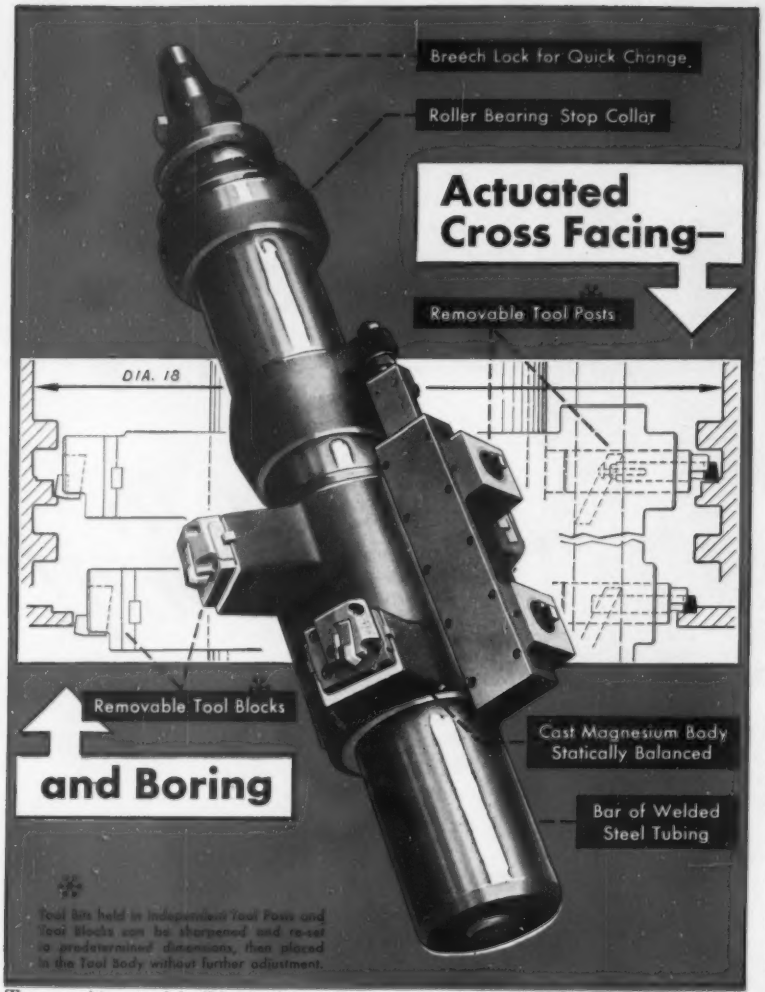

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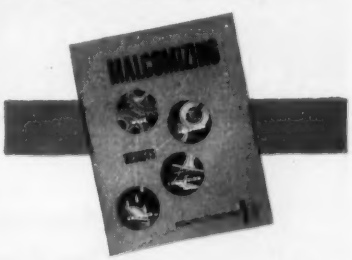

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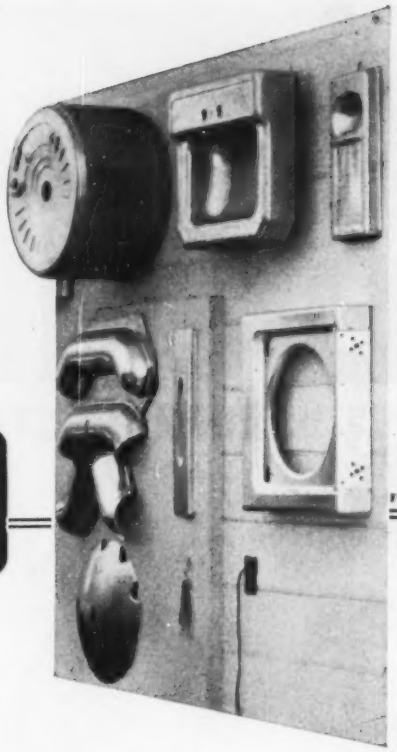

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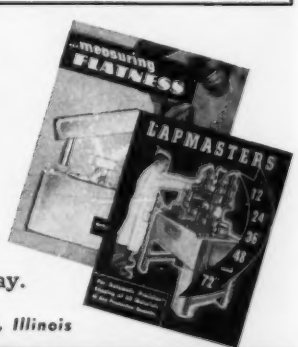

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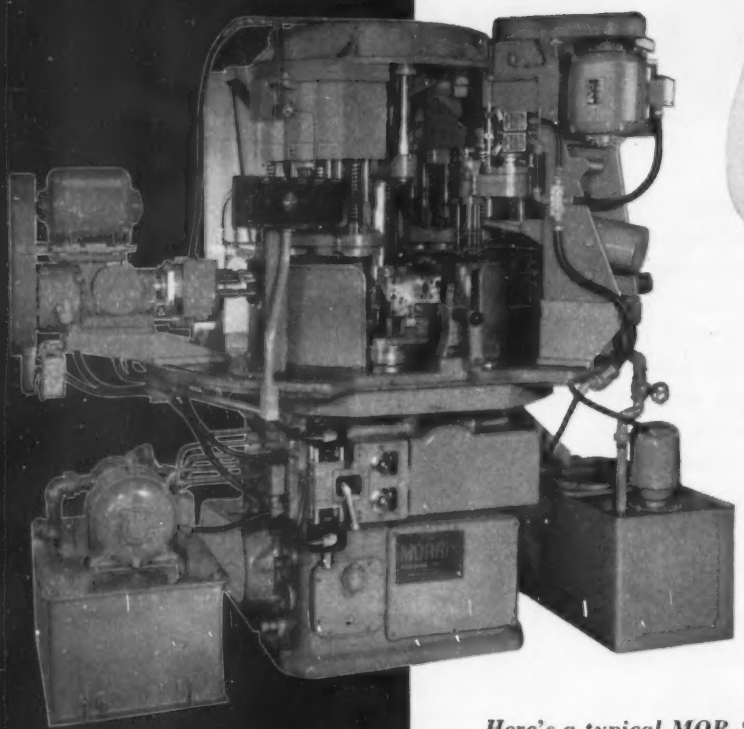

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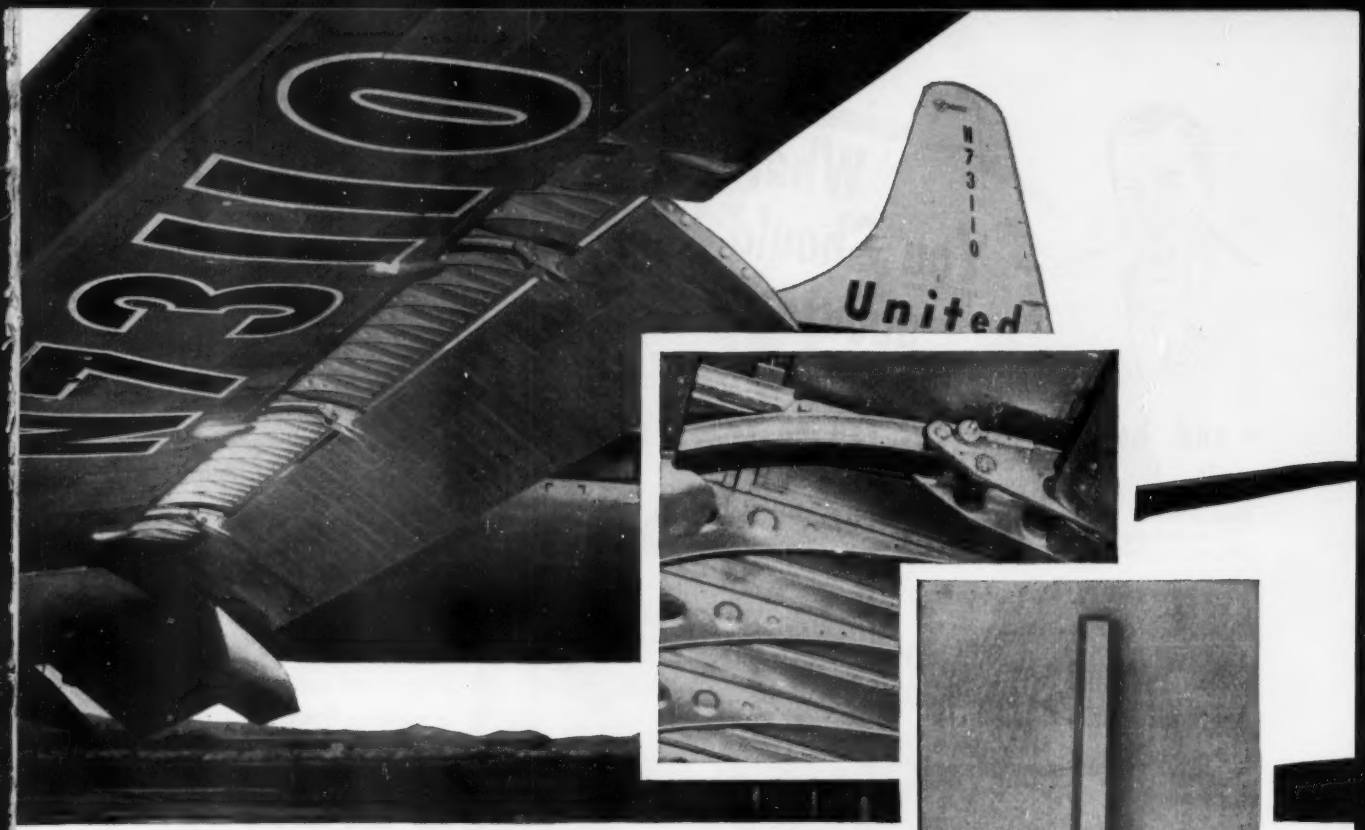

Cost of wing flap supports cut 75% with rolled structural T-sections of U·S·S Carilloy steel

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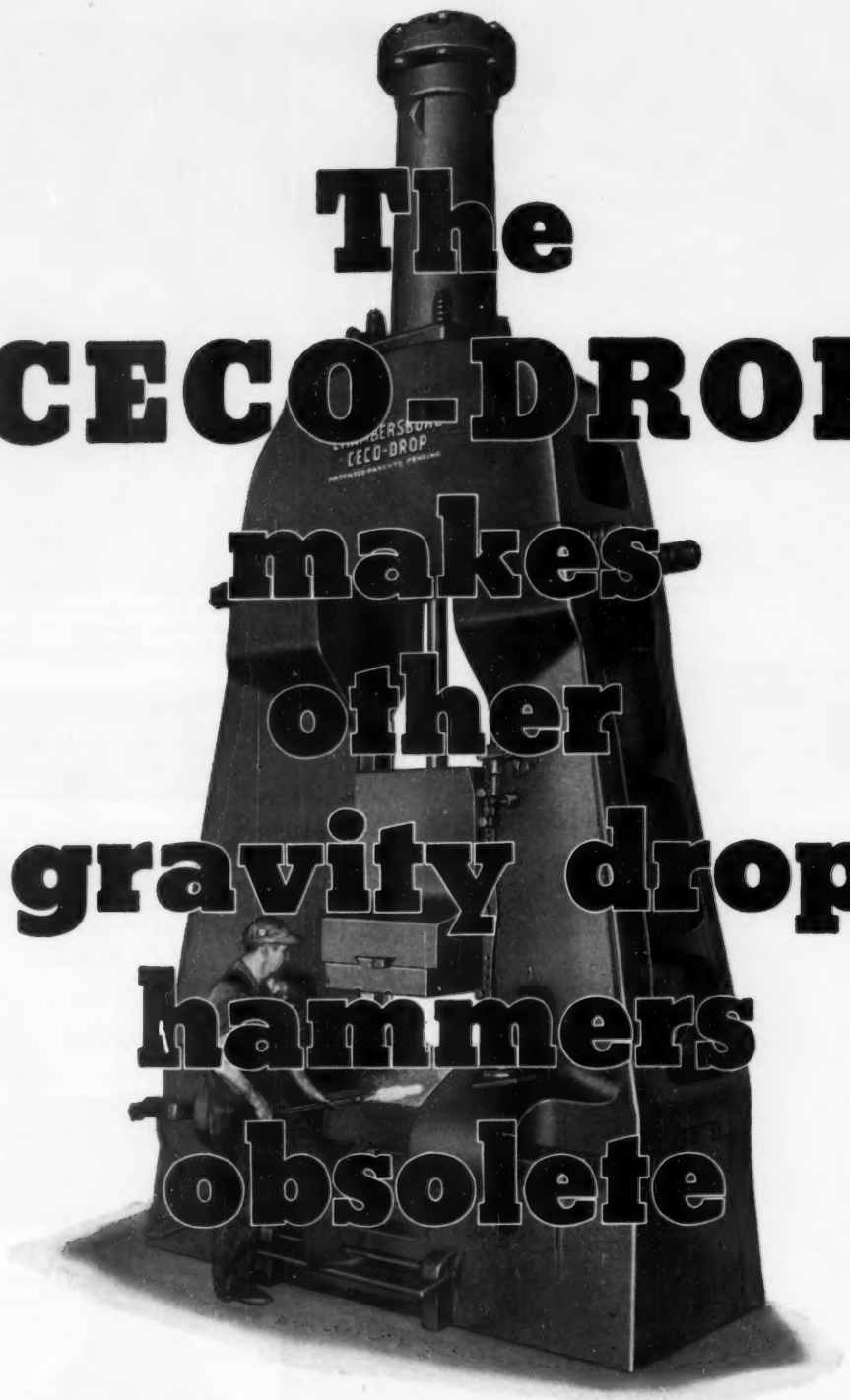
The CECO-DROP makes other gravity drop hammers obsolete



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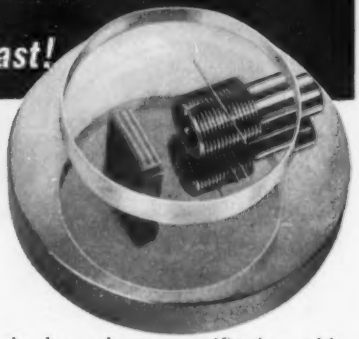

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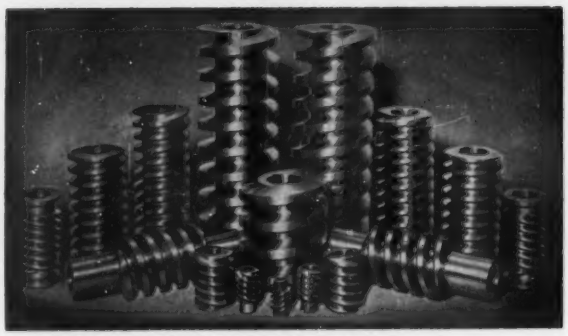


ADAMS custom made gears

While your product is still on the boards, plan on using Adams precision-made gears. Built by craftsmen . . . exactly as specified.

the ADAMS line . . .

SPUR GEARS	INTERNAL GEARS (Spur and Helical)	SHAVED TOOTH GEARS (Spur and Helical)
BEVEL AND MITER GEARS	RATCHETS	GROUND THREAD WORMS
WORMS AND WORM GEARS	SPLINED SHAFTS	RACKS
SPROCKETS	LEAD AND FEED SCREWS	

The ADAMS Compa
Dubuque, Iowa, U. S. A.
ESTABLISHED 1893

GEARS

FINE GEARS MADE TO YOUR SPECIFICATIONS

Acme's New
Direct-Reading
CHAMFER
Micrometer
GAGE

Accurately, Directly, Reads End Diameters Of Chamfers Up To 1".
TWO MODELS
From 0° Chamfer To 90°
and 90° Chamfer To 127°
included angle maximum Chamfer
Chamfer Depths Easily Computed
Simple To Use

● Reads like any standard depth micrometer. Precision made for close tolerance work. Saves time, reduces error, reduces rejects. Quickly pays for itself. Send for details.

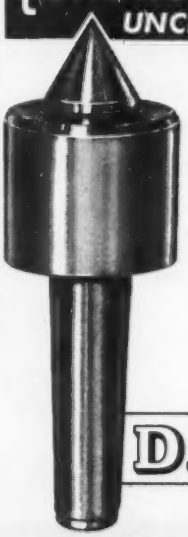
ACME
INDUSTRIAL COMPANY
209 N. Laflin St., Chicago 7, Ill.

MFRS. OF STANDARDIZED DRILL JIG AND FIXTURE BUSHINGS

OUTLASTS DEAD CENTERS MANY TIMES OVER!

QUADRO PRECISION LIVE CENTERS

UNCHALLENGED ACCURACY!



Get every dollar's worth of production from QUADRO PRECISION LIVE CENTERS—designed to support the HEAVIEST load at HIGHEST speed for the LONGEST time! Guaranteed accurate to .00005"—they will outlast dead centers by far!

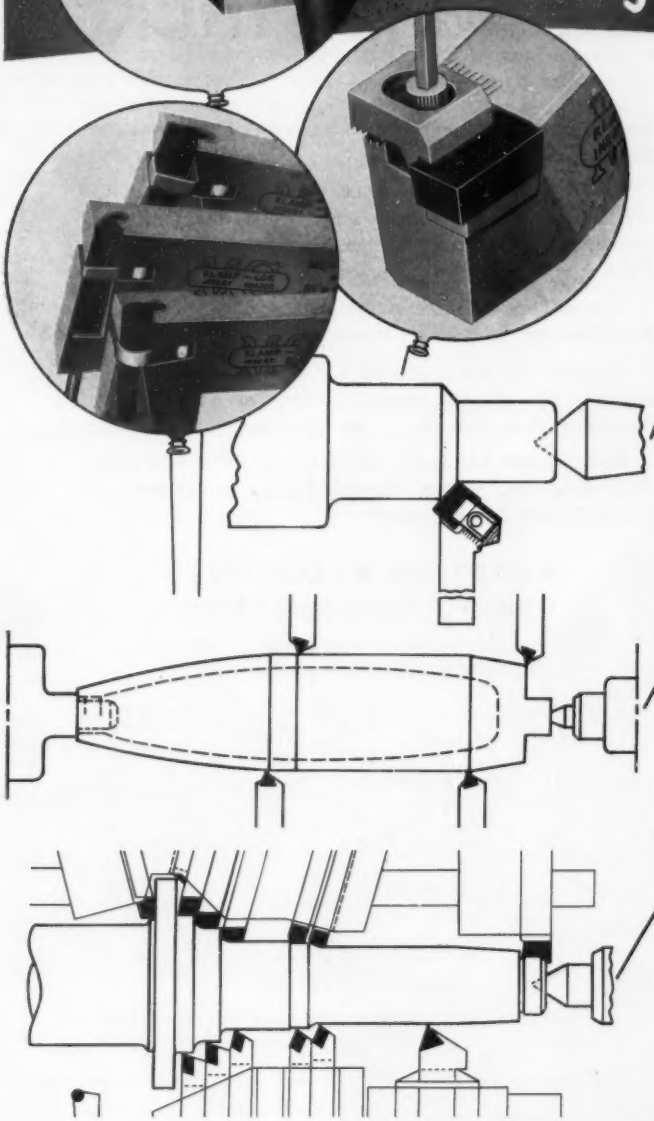
Each QUADRO CENTER completely eliminates friction—two double row pre-loaded ball bearings absorb combined radial end thrust. You'll discover its remarkable efficiency on a lathe, miller OR ANY OTHER MACHINE TOOL!

TODAY—see your regular supply dealer for Complete Facts or write to:

DAKON
TOOL & MACHINE CO., INC.
496 Broadway, Brooklyn 11, N. Y.

"TWO DECADES OF IMPORTANT TOOL PARTS PRODUCTION"

Talide Tipped Tools for EVERY Cutting Operation



USERS REPORT SUPERIOR RESULTS

LARGE PITTSBURGH ROLL FOUNDRY

PART	SAE 52100 forged chrome steel mill roll 28" O.D.
OPERATION	Rough turn and finish machine roll necks and barrel.
MACHINE	48" x 15' Mackintosh-Hemphill Lathe, 50 H.P. motor drive.
TOOL	H-Style Klamp-Lok Toolholder with horizontal clamped Talide insert—Grade S-88 for roughing —Grade S-92 for finishing.
DEPTH OF CUT	¾" for roughing cuts. ⅛" for finishing cuts.
FEED	.050
S.F.M.	125 to 210
RESULTS	Talide tools held cutting edge 40% longer per grind than previous grade used — even at temperatures of 1700° Fl

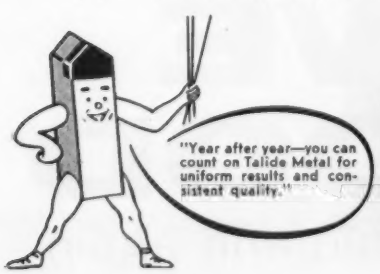
LARGE CHICAGO SHELL PLANT

PART	105 M/M (M-1) H.E. Shell.
OPERATION	Rough turn shell body, 1050 Steel Forging.
MACHINE	12" x 21" Fay Automatic Lathe.
TOOLS	TB-16 Triangular Talide Inserts with 3/32" radius vertically clamped in Klamp-Lok Toolholder Grade S-92.
DEPTH OF CUT	⅜"
FEED	.035
S.F.M.	325
RESULTS	45 Shells per grind or 25% increase over previous average of 35 shells.

LARGE MID-WEST TRACTOR PLANT

PART	Shaft Steering Clutch, SAE 8654-H Brinell 370.
OPERATION	Rough Straddle Face Flange, turn all diameters, form undercut and base.
MACHINE	16 x 60 Sunstrand Automatic Lathe.
TOOLS	8 Talide-tipped facing, chamfering, radius and form tools Grade S-88. 7 Klamp-Lok Toolholders with round, triangular and parallelogram Talide inserts Grade S-88.
DEPTH OF CUT	9/32" to 7/16"
FEED	.022
S.F.M.	156
RESULTS	Production up 20% — Scrap and rejects down.

Complete stocks of standard Talide Tools and Tips are immediately available from our warehouses located in Newark, Youngstown, Detroit, Chicago and Los Angeles. Write for General Catalog No. 54-G, Metal Carbides Corporation, Youngstown 7, Ohio.



METAL CARBIDES CORPORATION

MC TALIDE

YOUNGSTOWN 7, OHIO

SINTERED CARBIDES · HOT PRESSED CARBIDES
HEAVY METAL · CERMETS · HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Communist machine-gun fire dropped him in combat. But whole blood kept him alive, saw him through the hospital. He thanks you for his life.

She'd been exposed to polio. A new serum, *Gamma Globulin*, made from blood, helped ward off the d eadd disease. She thanks you for her life.

A tornado whipped suddenly across her home town. She was badly injured by falling debris. But a quick operation, several transfusions pulled her through. She thanks you for her life.

Three grateful people say: "We're HERE... because you were THERE!"

Each one of these people is alive today because someone gave blood.

If you've given blood before, you know how easy it is —how quick and painless. And you know what a wonderful feeling it is when you realize that what you've done may give another person his life.

Now you are asked to give blood . . . again and again. And you can do it safely every 3 months.

Because America's need for blood has increased enormously—for our armed forces, for accident and disaster victims at home, for new disease-fighting serums.

Many a life hangs in the balance! Will you help? Call your Red Cross, Armed Forces or Community Blood Donor Center today!

BUSINESS EXECUTIVES CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLANT BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOODMOBILE MAKE REGULAR VISITS?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . the need for blood is **urgent!**

NATIONAL BLOOD PROGRAM

GIVE BLOOD

...give it again and again

MASSIVE NEW SIMMONS PIT LATHE

performs above specifications

FOR LUKENS STEEL

MACHINES 14-FOOT-DIAMETER ALLOY STEEL DRYER ROLLS

Simmons engineers designed and built this unusual lathe to meet Lukens Steel Company's problems in machining the outer surfaces of their Steam Jacketed Dryer Rolls.

These unwieldy rolls, which run as large as 14 feet in diameter with 30-foot centers, had to be precision machined to a smooth, highly-polished finish. Any irregularities would result in poor heat transfer.

RESULT: *Lukens engineers report that this pit lathe is performing above the specifications that they originally set.*

Turning and grinding carriages on the lathe are motor-driven over the length of a 42-foot bed and can work rolls from three to fourteen feet in diameter. The tool carriage runs parallel to the pit and the surface of the slowly-turning rolls. All movement is synchronized for maximum accuracy.

If you have a production problem which might be solved by a large, special machine tool, Simmons engineers may be able to help you as they have helped so many others. Write or phone us your problem today. And ask for our quarterly publication, *The Simmons Way*. It describes many other case histories about successful machine tool design, manufacture, and rebuilding.

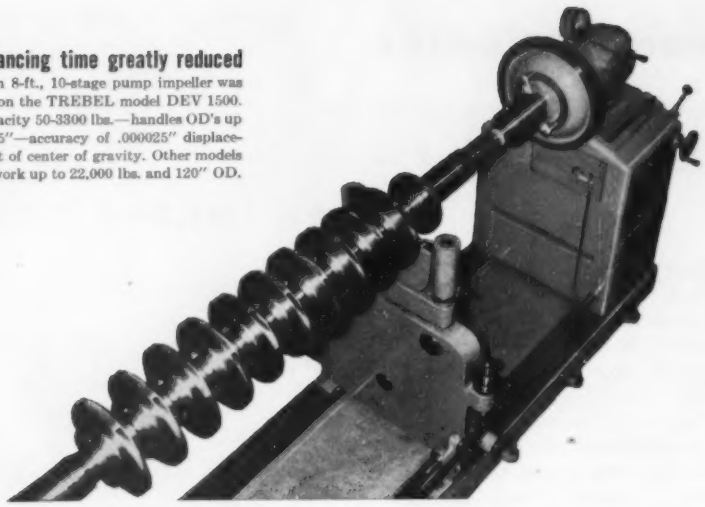
End-on view *of Luken's Pit Lathe shows pit needed for free clearance of large diameter rolls. Carriage travels length of pit.* **At Right:** *42-foot, 17-ton bed of the lathe; ways were finish-ground to 0.002 in.*

SIMMONS—FOR THE LARGE SPECIAL MACHINE TOOLS THAT OTHERS SELDOM BUILD

SIMMONS MACHINE TOOL CORPORATION, 1759 North Broadway, Albany 1, New York

New York Office: 50 East 42nd Street, New York 17, New York

Balancing time greatly reduced when 8-ft., 10-stage pump impeller was put on the TREBEL model DEV 1500. Capacity 50-3300 lbs.—handles OD's up to 65"—accuracy of .000025" displacement of center of gravity. Other models for work up to 22,000 lbs. and 120" OD.



How major pump maker

detects unbalance in seconds with TREBEL counter-vibration principle

That's all it takes—less than a minute—to locate amount and angle of unbalance in this 10-stage pump impeller, because—

TREBEL BALANCERS use a unique principle in which mechanical counter-vibrations counteract unbalance.

No previous calibration is necessary—operator takes direct readings in the TREBEL BALANCER during the first run—amount of unbalance in ounce-inches; location in degrees.

Any two balancing planes can be selected along entire length of the rotor. No cutting and trying—cross effect eliminated.

Readings in units of compensation—such as depth of hole to be drilled, or length of solder to be added—are possible.

No special skills are required.

When this pump manufacturer chose a Model DEV 1500—his third TREBEL—the machine was installed—*and the operator trained*—within two days. And it hasn't required a single service call in 12 months.

This is typical of TREBEL performance in hundreds of important plants here and abroad—the kind of performance *you* can expect, too.

Delivery is prompt; also engineering service and stock parts.

Write for Catalog "A" and ask for TREBEL demonstration at your plant

KO KURT ORBAN COMPANY, INC.

205 East 42nd St., N.Y. 17 • Offices in Cleveland, Detroit, Los Angeles, San Francisco, Houston

Canadian sales by Kurt Orban Canada Ltd., Toronto, Canada

RAPID SET-UPS with extreme accuracy—every time and on the first try!

Brookfield TOOL HOLDER

One Brookfield Tool Holder = One Conventional Tool Holder + Stock of at least 100 Bushings.

In Essence: A Floating, Precision Vise

- Adjustable V Jaw
- Axially True Design
- Balanced-Pressure Locking

No more fussing with bushings . . . just slip tool in jaw and tighten . . . run-out is less than .0001 per inch . . . Brookfield Tool Holders guarantee clean, easy, solid set-ups **every time and on the first try!** Models available for nearly all automatic and hand screw machines, turret lathes, radial drills, etc. Also useful as Adjustable Steady Rest and Work-Holder.

Write for fully descriptive brochure.

BROOKFIELD, INC. 172 Newbury St. Boston 16, Mass.

PRODUCTION METHODS at GRAFLEX

Here are details of unique precision production methods at Graflex, Inc., Rochester. An *American Machinist* Special Report. 20 pages, illustrated, 25 cents a copy.

READER SERVICE DEPT.
American Machinist
McGraw-Hill Building
New York 36, N. Y.

How to Control SHOP COSTS

Skillful control of all operations involved in developing, manufacturing, and marketing the products of your company bears strongly on your company's profit situation.

This *American Machinist* Special Report describes methods of controlling manufacturing costs that can be applied in jobbing as well as production shops. Basic concepts of common costing methods are examined, and emphasis is given the fundamentals upon which all systems must be based to produce accurate operating figures.

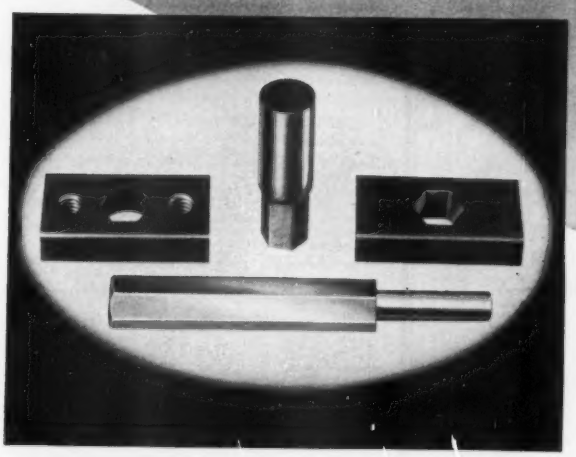
Numerous graphs, charts, and reproductions of the many operating reports required add to the helpfulness of this fifteen-page report by Albert E. Grover, Cost Consultant.

25 cents a copy

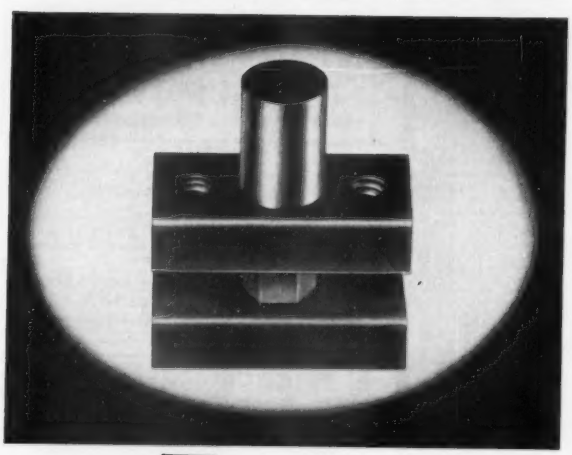
Reader Service Department

American Machinist
McGraw-Hill Building
New York 36, N.Y.

Can You Make This Punch, Die and Stripper Plate Out of Tungsten Carbide for



$35.50*



In Your Plant

*Electrode manufacturing time	2 hours
Cutting time on die	½ hour
Cutting time on stripper	½ hour
Cutting time on punch	½ hour
Accumulated setup time	1 hour
TOTAL LABOR TIME:	4½ Hours
Cost of Tungsten Carbide material:	$22.00

elox corporation of michigan

◀ we will show you how

728 N. ROCHESTER RD. • CLAWSON, MICHIGAN

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

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$1.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count 1 line additional.

POSITION WANTED undisplayed rate is one-half of above, payable in advance.

PROPOSALS $1.50 a line an insertion.

INFORMATION

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

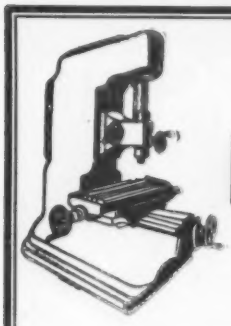
EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate is $12.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches to a page. A. M.

NEW ADVERTISEMENTS: Address N.Y. Office, 330 W. 42 St., N.Y. 36, N.Y., for February 1st issue closing January 18th.



SEARCHLIGHT Equipment Spotting SERVICE

This service is aimed at helping you, the reader of AMERICAN MACHINIST, locate used and surplus new metalworking machinery and equipment not currently advertised. (This service is for user-buyers only.)

First, read the dealer ads on the following pages. A 5-minute study may locate the equipment now.

Second, send in the specifications of the equipment wanted on the coupon below, or on your own company letterhead, to

Searchlight Equipment Spotting Service
c/o American Machinist
330 W. 42nd St., N.Y. 36, N.Y.

Your requirements will be brought promptly to the attention of the used equipment dealers advertising in this issue. You will receive replies directly from them.

NO CHARGE • NO OBLIGATION

Searchlight Equipment Spotting Service
c/o American Machinist
330 W. 42nd St., New York 36, N. Y.

Please help us locate the following used equipment:

.....

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NAME ..... TITLE .....

COMPANY .....

STREET .....

CITY ..... ZONE ..... STATE .....

1/18/54

REPLIES (Box No.):
Address to office nearest you
NEW YORK: 330 W. 42 St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

SELLING OPPORTUNITY OFFERED

MANUFACTURERS REPRESENTATIVES wanted on percentage basis to call on Mill Supply Houses to handle additional line of precision tools for machinists and tool rooms. 45 years in business. Advise current lines and territory concerned. RW-9760, American Machinist.

SELLING OPPORTUNITY WANTED

NORTHERN CALIFORNIA Representation can provide capable, intensive coverage on tooling, inspection, machinery. Successful sales engineer with solid technical and sales experience establishing as representative. Well acquainted with distributors and consumers. RA-1184, American Machinist.

How are your sales in the Prosperous Dynamic Delaware Valley?

Established Sales organization representing outstanding nationally known lines would like to represent a manufacturer of Standard and Special Milling Cutters in this rapidly growing region.

Write giving details and catalogues to

Dept. 44
DeVAL SALES CO.
5823 Green St., Philadelphia 44, Pa.

BUSINESS OPPORTUNITY

Machine manufacturer in New Jersey, well equipped, capacity 125 men, looking for some patented or mass production item, to buy outright or royalty basis.

BO-1073, AMERICAN MACHINIST
330 W. 42 St., New York 36, N. Y.

PEACOCK CORPORATION
Propane Gas Installations
and
Anhydrous Ammonia Plants
Paul E. Peacock, Jr., Pres.
Box 268 Westfield, N. J. Westfield 2-6258

Don't forget the
BOX NUMBER

When answering the classified advertisements in this magazine, don't forget to put the box number on your envelope. It's our only means of identifying the advertisement you are answering.

BUY FROM STOCK
Telephone
BAKER 5887

FALK
MACHINERY COMPANY

10 WARD ST.
ROCHESTER 5
N. Y.

Every Item Guaranteed as Represented

AUTOMATIC, #00G B & S High Speed, M.D.
AUTOMATIC, #0 B & S Wire Feed Screw, Late.
AUTOMATIC, Cleveland Model #B-1½" Spl. Spdl.
AUTOMATIC, #2 B & S Wire Feed, 1" screw. Cap.
AUTOMATIC, #4 Brown & Sharpe, M.D. Tooling.

BALANCER, Andersen Bros. 14"x64", Roto-Checker.
BORING MILL, 36" Bullard M.D., V.T.L.
BORING MILL, 2½" Lucas Horiz. M.D.
BORING MILL, Lucas Horiz., 3" Bar, M.D.
BORING MILL, Giddings & L #0 Horiz. 3½" Bar.
BORING MILL, 100" Niles B-P M.D. 2 swivel hds.
BARRELS, Tumbling Lupomatic, Schutte & Koerting.
BRAKE, #335 Chicago, M.D., Press 6', #338.
BRAKE, #185 Chicago Power Apron, 8'3/16" cap.
BROACH, La Pointe 5 ton, 36" stroke, #1 Late.

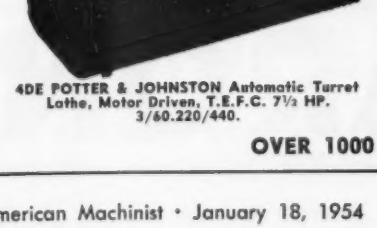
CHIP WRINGER, 23" Barrett, M.D. with Hoist.
COMPRESSOR, Ingersoll Rand ER-1, 10 HP. M.D.
COMP., 15 HP, 10 HP, Gardner Denver, M.D., New.
COMPRESSOR, C-P 50 HP. M.D., 10x10, 278 CFM.
CRANE, OET Ricker 2 tons 11'9" span.
CRANE, Canton #8 Portable Gooseneck 3 ton cap.

RADIAL DRILL, 3'9" Mueller, M.D.
RADIAL DRILL, 3'11" Canedy-Otto, M.D., Late.
RADIAL DRILL, 4'11" Cincinnati Bickford, M.D.
RADIAL DRILL, 5'10" Cincinnati-Bickford, M.D.
RADIAL DRILL 6'15" Cincinnati-Bickford, M.D.
RADIAL DRILL, 30" Walker Turner M.D., Late.
DRILL, Fosdick 16", S.S. Power Feed, M.D.
DRILL, #2 Colburn H.D. #4 M.T., M.D.
DRILL, #121 Baker Auto. S.S. Cam Operated.
DRILL, Deep Hole, Avey-Draulic #2 M.D.
DRILL, Edlund #2B, 3 spdle, #2 M.T., 16".
DRILL, 6 Sp. Avey 12" overhang, #3 M.T., M.D.
DRILL, Cincinnati 21" with Tapping Attach. M.D.
DRILL, 21" Cinci. Bick Super Serv. Box Col.
DRILL, Natco Multiple Spdle CS, 10 Sp. M.D.
DRILL, Natco Multiple Spdle #12, #1 M.T., M.D.
DRILL, PRESSES, Leland Gifford #1MS, 1, 2, 3, 4
DRILL PRESS, #2MS Buffalo Forge single spindle.
DRILL, Barnes, 24" S.S. #4 M.T., 1¾" cap.
DRILL PRESS, #25 Foote-Burt S.S. 24", #5 M.T.
DRILLS, #14, #15, #16, #18 Buffalo Forge, M.D.
DEEPFREEZE Motor Products 40 below zero.
DEMAGNITIZER, SB-911 Magnaflux, late type.

FACING HEADS, 20" & 24" Mummert-Dixon.
FILER, 1-S Cochrane Bly Auto Saw Filer.
FILER, Type P4 Oliver Floor Type, M.D.
FURNACE, Westinghouse Elec. 18 KW. 2100°F cap.

GRINDER, Sanford Surf. 8"x12" cap., New.
GRINDER, #1 Wilmarth Norman Hand Surf., 6"x12".
GRINDER, #2 Imperia Univ. Tool & Cutter, New.
GRINDER, #2 Cinci. Centerless Filmatic, Late Type.
GRINDER, #4 G & L Univ. Tool & Cutter, M.D.
GRINDER, Disc, Besly #205, 18" Dble End.
GRINDER, Heald Rotary #25, M.D. 16" Cap.
GRINDER, Cylindrical, Norton 10"x24", M.D.
GRINDER, Brown & Sharpe #4 Univ. 12"x60".
GRINDER, Thread, Jones & Lamson #TG-615, Late.
GRINDER, Heald #72A-3 Internal Size-Matic.
GRINDER, 14"x36" Pratt & Whitney Vert. Sur.
GRINDER, Pratt & Whitney 22"x84" Vert. Surface.
GRINDER, Greenfield #12 Int. Hydromatic, M.D.
GRINDER, Oliver Auto. M.D. Drillpointer, #51.
GRINDER, #33 Abrasive Vert. Auto. Surface, M.D.
GRINDER, #22 Heald Horiz. Rotary Surface, M.D.
GRINDER, Diamond Snagging 10 HP, 24"x4½".
GRINDER, Norton 6x18 Vert. Surface, Hyd. Late.
GRINDER, #60 & #70 Heald Internal.
GRINDER, 6"x18" Norton Hyd. Horiz. Surface, M.D.
GRINDER, Landis 6"x18" Cyl., M.D.
GRINDER, Sellers Type #1A Tool, 24" wheel.
GRINDER, 37" Wheel Dia. Osterheim Disc, 24" cap.
GEAR LAPPER, #8LS, #13LSI Fellows, Outboard Supports, Detachable Laphead, Late.
GEAR SHAPER, Fellows #6 High Speed, M.D.
GEAR SHAPER, Fellows #7 High Speed, M.D.

HAMMER, Rochester Hisped, all sizes, M.D.
HAMMER, Bradley 200# Rubber Cushioned Helve.
HEADER, Manville #1 S.S.D.D. Cold 3/16".
INDUCTION HEATER, 16 KVA Ecco Hi Frequency.
INDUCTION HEATER, 30 KW Lepel, Late Type.
IRONWORKER, #½ Buffalo F. Univ. M.D., Coper, Notcher.
AIR MOTOR HOIST, Ingersoll Rand 2000# cap.
ELECTRIC HOISTS, 500-4000 lbs. Whiting, NEW.
HONE, #194 Barnes Vertical, M.D., Hyd. Late.

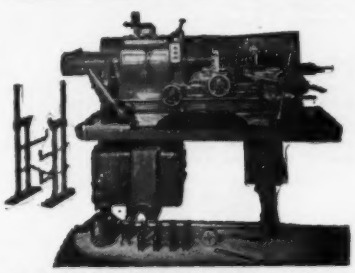


4DE POTTER & JOHNSTON Automatic Turret Lathe, Motor Driven, T.E.F.C. 7½ HP. 3/60.220/440.

KEYSEATER, #5 Mitts & Merrill, Giant, M.D.
LAPPER, 2F Norton Vert., M.D., late type.

2—No. 7 BARDONS & OLIVER Geared Head

Full Universal Turret Lathe, Preselector Head. Bar Feed 2½" cap capacity through spindle. Late Type, Motor Driven with tooling.

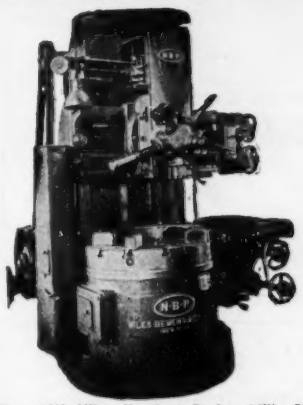


#2 WARNER & SWASEY Geared Head Turret Lathe, 12 Spindle Speed, Bar Feed.

LATHE, Le-Swing 8"x108", M.D., A.C. Rebuilt.
LATHE, Porter-Cable 9"x15" Geared Head Prod.
LATHE, #6 WSL Reid Smallpiece Prod., Late Type.
LATHE, LeBlond 14"x8' Q.C.G. M.D.
LATHE, Hendey 14"x8' Q.C.G., Taper Attach. M.D.
LATHE, American 16"x8' Q.C.G., Grd. Hd. M.D.
LATHE, Lehman 16"x7' Q.C.G., M.D.
LATHE, American 18"x10' Q.C.G., Grd. Hd.
LATHE, South Bend 18/28"x8' Gap Bed, Q.C.G. M.D.
LATHE, Reed-prentice 20"x10' Grd. Hd. M.D.
LATHE, 20"x16' Reed Prentice Grd. Hd., Late Type
LATHE, LeBlond 22"x10' Q.C.G., M.D.
LATHE, 24"x10' Axelson Grd., Late, M.D.
LATHE, 24"x12' Boye & Emmes Grd. Hd., T.A., Late
LATHE, Putnam 23/32"x12' Q.C.G., M.D.
LATHE, LeBlond 24"x14' Q.C.G., Grd Hd.
LATHE, Lodge & Shipley 26"x14' Q.C.G., M.D.
LATHE, Bridgeford 27"x12' Geared Head, M.D.
LATHE, 27"x16" Niles Timesaver, Grd. Hd., M.D.
LATHE, Bridgeford 32"x16' Q.C.G., Grd. Hd.
LATHE, 42"x18" Pittsburgh Geared Head, M.D.
LATHE, Buffing Dble. End &VMT5, Devine Bros.
LATHE, Turret #1 Bardons & Oliver Electric Head.
LATHE, Turret, #2 Simmons Vari Drive 220 V.
LATHE, Turret #2 W & S Univ. Grd. Hd., Late.
LATHE, Turret, #4 Warner & Swasey Univ. 1½".
LATHE, Turret #5 Warner & Swasey Univ. Late.
LATHE, Turret #6 Warner & Swasey Grd. Hd. Ram Type, Bar Feed. Motor in base.
LATHE, Turret #2 Cinci. Acme Univ. Geared Head.
LATHE, Turret #3A Warner & Swasey Univ. M.D.
LATHE, #60I Oster Hand Turret, M.D., Late Type.
LIFT TRUCKS, 1 & 2 ton, Platform & Fork.

MILL, #1-14 Kent-Owens Hyd. Late Type.
MILL, No. 1½ Milwaukee Plain Horiz.
MILL, #2 Kempsmith Maximiller Horiz., Vert. Hd.
MILL, #08 Cine. Vert. Prod. Rotary Table.
MILL, 2M Cincinnati Univ. Heriz. M.D.
MILL, #3B Brown & Sharpe Vertical, M.D.
MILL, #3B K & T Heriz., M.I.B.
MILL, #3B K & T Vert. M.D.
MILL, #3VB Hardinge Vert. Bench, M.D.
MILL, #4B Brown & Sharpe H.D., Horiz. M.D.
MILL, #14 Garvin Plain Heriz., M.D.
MILL, #0Y Brown & Sharpe Plain Horiz., M.D.
MILLING MACHINE, #2B K & T Heriz., M.D.
MILL, Cinci. Heriz. #3, #4, High Power, M.D.
MILL, #1 Brown & Sharpe Plain Horiz., M.D.
MILL, #0-B Cinci. Vert. Prod. Late, M.D.
MULT-MILLER, U. S. Tool #MM-1-6 Auto. Prod.
MILL, No. 0 Brown & Sharpe Plain Horiz.
MILL, #0 Douglas Plain Heriz. M.D., Coolant.
MILL, #0 Vernon Hand Mill, M.D., Late.
MILL, #0-8 Cins., Heriz. Rise & Fall, Late.
MILL, 2A Brown & Sharpe Heriz. Univ., M.D.
MILLING MACHINE, Kempsmith #2 Heriz. Univ.
MILL, #3 Cine. Univ. Heriz., M.D.
MILLING MACHINE, LeBlond #4 Heriz. Univ.
MILL, #2 Vert. M.D. Brown & Sharpe.
MILL, #3 Cinci. Vertical Hi Power, M.D.
MILL, #5C Baker Vert. Die Sinker, M.D.
MILL, 42"x36"x12' Ingersoll Planer Type, 4 hds.
MILLING MACHINE, #2 Van Norman Duplex, M.D.
MOTOR GENERATOR SET, Gen Electric, 100 K.W.
NIBBLER, #136 Savage 36x3/16" Cap., M.D.
NAILING MACHINE, No. 16—48"-54" Morgan, Late.

THREADING, Staybolt Lassiter Millholland 1½".
THREAD MILL, 7½x11 Hansen-Whitney, Univ.
THREAD MILL, 6x14 Pratt & Whitney No. 1105.
THREAD MILLER, Plan-O-Mill #3 Planetary Form & Thread Semi-Automatic Milling Machine, Late.



36" x 44" Niles Vertical Boring Mill, Side Head, Motor Driven.

42" Late Model KING Vertical Boring Mill. A.C. Motor Drive; 5 position turret head; Right Hand Side Head; 4 jaw Chuck table; Bijur System, Pendant control. New 1946. Excellent condition.

PAPER SHREDDER, No. 10 Mitts & Merrill, M.D.
PLANER, Cincinnati 30"x30"x12' A.C., M.D.
POWER PRESS, Bliss #164 Open Back, M.D.
POWER PRESS, Bliss #3A S.S. Dble. Crank Grd. 45 tons, 4" stroke, 36"x26" Bed Area, M.D.
POWER PRESS—Bliss-Consolidated #163-B Straight Side Dble. Crank 45 tons, M.D.
PRESS, D72 & DG73 Ferracuts, Redraw, M.D.
PRESS, #2½ & #5 Toledo, OBI, Motor Driven.
PRESS, #5 Johnson OBI, 56 tons, new.
PRESS, #7 & #8 Johnson OBI 75 & 150 tons, New.
PRESS, #59½ Toledo Str. Side, M.D., 440 tons cap.
PRESS, 70H & 125PA Drake Hyd. Arbor, New.
PRESS, #78½ Bliss tr. Side, 400 ton cap. M.D.
PRESS, Bliss #18, #19, #20, #21, OBI, A.C., M.D.
PRESS, Waterbury-Farrel High Speed 60 tons #3W.
PRESS, 68 C Bliss Double Action, 3 crank.
PRESS, Lucas 15 tons Power Arbor, M.D.
PRESS, #68 Whitney Deep Thr. 24" feet.
PRESS, P2, P3 Ferracute M.D. Reel feed.
WHEEL PRESS, 600 ton Niles-Bement-Pond, A.C.
PANTOGRAPH, #1A Gorton M.D. Engraving.
PUNCH, #46 Buffalo Forge Vert. Cap. 1"x1½" M.D.
PUNCH, R-4 Wiedemann Turret, 10 Stat. 24" thr.
PUNCH, Hecker Turret, 8 station, cap. 2½" hole.
PUNCH, H & J #2 Sgle. End. 24" Thr. 1" thru 1".

RIVET SETTER, #140 Chicago M.D., ¼" cap.
ROLLS, #1 Buffalo Forge Wrapping, M.D.
ROLLS, #1, #2 Buffalo Forge Vert. Angle Bending.
ROLLS, 72"x1/4" Lown Initial M.D., New.
ROLLS, 72"x12 ga. Wysong & Miles, Initial Type, M.D.

COLD SAW, Wagner 10"x10" cap., M.D.
COLD SAW, Espen-Lucas #700, 48" dia. blade, M.D.
CUT-OFF SAW, Radlas "J" DeSanno.
CUT-OFF SAW, Yates-American #M-90, M.D.
SAW, #8 Marvel Bandsaw, 10"x10" cap.
SAW, #4B Marvel Hack Saw 6"x6" Cap., M.D.
SAW, #20-C Racine Shear Cut 6"x6" cap., M.D.
SAW, 10"x10" Racine Hyd., Late Type, M.D., #30C.
SAW, Band Tannewitz GH-36" High Speed, M.D.
SAW, 14-26 DeALL Bandsaw, Late.
SHAPER, 16" Newark, Vise, M.D.
SHAPER, 20" Gould & Eberhardt V-ways, Vise, M.D.
SHAPER, 16" Pratt & Whitney Crank, M.D.
SHAPER, 20" Rockford Univ. M.D., Tilting Table.
SHAPER, 32" Cinci., B.G., Motor Driven, M.D.
SHAPER, Morton, 36" Draw-Cut, 4 speed M.D.
SHEAR, 10' x 10 ga. cap. Wysong & Miles, M.D.
SHEAR, 10' x ¼" cap. Wysong & Miles, M.D.
SHEAR, 6' x 14 ga. Parker M.D., Late Type.
SHEAR, #26 Buffalo Forge Slitting Armor Plate.
SHEAR, Quickwork #11 Rotary 60° Throat, 10 ga.
SCREW SLOTTER, #2 Waterbury Farrel Auto.
SLOTTER, 12" New Haven Vertical M.D.
SPOTTER & SCROPER, Anderson Power Unit, Late.
SPRU CUTTER, Milwaukee 36 tons, 2½ cap., M.D.
SURFACE PLATES & TABLES, all sizes.
TAPPER, #1 Cam Hasking, Motor Driven, Late.
TAPPER, #1 Bakewell (Warner & Swasey) Late.
THREAD ROLLER, #20, #30 Waterbury Farrel.
TRUCK, 2000 lbs. Hyster Fork Lift 9' Model QT-20.
TRUCK, 4000 lbs. LT-44 Towmotor Fork, Lift 9'.
BRINELL TESTER, Type 03DR. Steel City.
WELDER, 500 amp. Westinghouse Flexers A.C.
WELDER, 200 & 400 amps. Gen. Elec. Portable Arc.
WELDER, 75 KVA Federal M.D., Spot.
WIRE STITCHER, Morrisen & Acme, M.D

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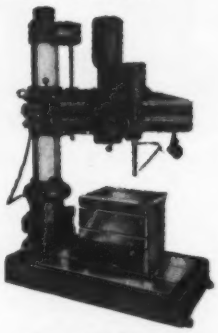
AUTOMATICS

Brown & Sharpe (1) Model #4
Brown & Sharpe (1) Model 2G, 1¼" capacity.
Brown & Sharpe (8) Model 0G, ⅝" capacity.
Brown & Sharpe (4) Model 00G, ⅜" capacity.
Brown & Sharpe #4 Automatic New 1939
Coco Screw Machine ⅜" capacity.
Cleveland Model AA-11, Serial # 36586.
Cleveland Model B. Serial #42618/843.
Cleveland B18—1¼" Cap. Late.
Conomatic 4 Spindle, Serial #2309FF, 1½".

BORING MILLS

Bullard 24" V.T.L. Spiral Drive
Bullard 8"—8 spindle, Multi-Matic
Cleveland 2½" Bar Capacity, Defiance 3¾" Bar
Giddings & Lewis #32, 3" #25, 2½" Bar.
Kings 42", 72" Vertical 2 rail heads
Niles-Bement-Pond 4" Bar, 60" Vert.
Niles-Bement-Pond 60" Vertical
New 3" Horizontal Boring Mill



NEW RADIAL DRILLS
DRILLS AND RADIALS

American 6'x15" Universal, 4'13", 3'9"
Baker No. 321 Vertical Boring & Drill
Bausch Multi-spindle
Buffalo #2 Motor Spindle, #16—4 Sp.
Buffalo: Power No. 41, No. 42 RPMSTERS
Canedy-Otto 21" Sliding head, New
Cincinnati Bickford 6'15" col.
Edlund 8" Model 2B, Sliding Head
Natco #12, 20 spindle. Model B2A—10 Sp.
24" Sibley Sliding head
New Geared Box Col. Drills 24"
Foote-Burt #25 3" capacity
Leland-Gifford 2 LMS, 3 MS
Leland-Gifford No. 2—4 Sp. Hyd. Feeds
Sigourney 2 spindle

GEAR EQUIPMENT

Barber-Colman Mod. SHS, Sharpener
Barber-Colman #3, #2, #12 (3) also Type S.
Brown & Sharpe #3 Gear Mill, 26" Cap.
Fellows High Speed Shapers 712, 725, 71, 7, 61A
Fellows #20M Redliner, Flather 72" Cutter
Gleason Gear Rougher, Gleason #6 Power Tester
Gleason #2 Surface Hardener, No. 3 Gear Tester
Gleason #3 Spiral, #3 Straight Bevel
Gould & Eberhardt 36" Cutter
Michigan Gear Finisher 24" cap., 862-24A
Michigan 1708 Hob & Cutter 8"x24"
Mikron No. 79 Gear Hobbers
National Broach Red Ring Lapper, Finisher
Schuchardt & Shutte #1 Hobber

NEW 6"x18" Surface Grinder, Rapid Traverse, Built in Wheel Dresser & Coolant System, Horizontal, Traverse & Vertical Power Feeds.

GRINDERS, SURFACE

New 9x24" Hyd. Feed 10x18", 6x18"
Abrasive 8x24", #33 Vert. & #34
Brown & Sharpe #5, #2 with Chuck
Gallmeyer & Livingston—65
Heald 22—12" chuck, Arter 12", Covel No. 15
Norton—6x18
Portman 12" Chuck Rotary—Reid #3, 11"x36"
Pratt & Whitney 12x36" Vertical
Taft Pierce #1 Precision
Thompson 6x18

GRINDERS, MISCELLANEOUS

Brown & Sharpe #2 Universal 14"x28", #3 Univ.
Brown & Sharpe #5, 3"x18" Cylindrical
Brown & Sharpe #13 Universal Tool & Cutter
Bryant #5 Internal, chucking
Cincinnati 6x18" Hyd. #4—Centerless—#2
Douglas Tool & Cutter 8"x15"
Gardner Disc Grinder 30"—15 H.P. Motor
Grenby Models 1G1 & 1G2—Internal
Gorton Ped. Type Tool Grinder Mod. 375-2
Heald #73 Internal Centerless, #75A Internal
Heald 72A3 Int. Centerless Sizematic
J. & L. Thread; TG615, Lempco 54" Swing
Landis 6"x30" Type C Cyl., 10x24 Univ. 12x30
Norton #2 Tool & Cutter, No. 1 Tool & Cutter
Norton Type C 6"x18" Semi-Automatic cyl.
Norton 10"x18" Type C cylindrical, 6"x30" Cyl.
Norton 14"x96" cyl. 16x48 Univ.
Norton Roll Grinder 50"x28'
Oliver #510 Drill Pointer
Pratt & Whitney Radius Model R6
Sellers 6-G Drill Grinder, 6G Tool, K.O. Lee tool
Van Norman #666 Crankshaft

ENGRAVERS

Gorton #ME, 1D, 3U, 3Z, Deckel G1L, G1, G2
Preiss UAM
Taylor-Hobson 3 dimensional Pantograph
New, 3 dimensional Deckel type

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HYDRAULIC EQUIPMENT

8 and 9 oz. Injection Moulders
125 Ton Southwark Press, Bed 96"x30". 30" stroke, 2 to 4 ft. opening
150 Ton Triple Action HPM Press
250 Ton Watson & Stillman 28x24"
300 Ton Watson & Stillman 24x29"
300 Ton Watson & Stillman 20"x20" Platen 8" St. 19" opening
600 Ton Williams & White 42"x60"
800 Ton Williams & White 42"x60"
800 Ton W&S Hobbing Press

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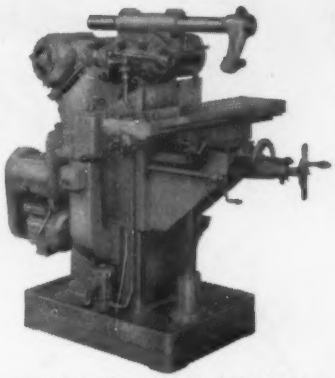
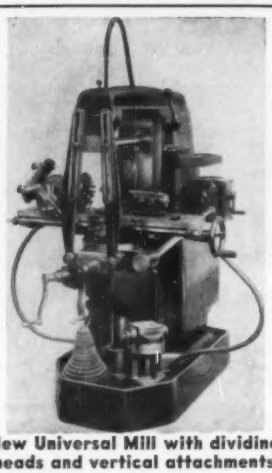


New Combined Vertical-Horizontal Milling Machine

Brown & Sharpe #2B Plain, No. 2, 3A, 21, #2L
Cinn. 08 Rise & Fall 2-24 Automatic
Cinn. #3, 4 Plain, #18 Mfg, #5-48 Hydro.
Kent Owens IV, 1-8, 1-14, 1M, 2-20
Kempsmith #1 Pl., Vert. & Div. Hd.
Milwaukee 2K, 4K
Milwaukee 2H Universal, 2H Plain
Milwaukee #2B, Plain & Univ.
Sundstrand #00, 0 Rigidmils
Sundstrand #3A Rigidmil with copying Attach, 33
Van Norman #2L Univ., Dividing Head
(8) Van Normans #12—Hor/vert—Late



New Universal Mill with dividing heads and vertical attachments

MILLS, VERTICAL

Cincinnati (2)—1-18 Plain Automatic
Cincinnati #3, 08 Vertical
Cleveland No. 1 table 8"x32"
Gorton 8D Super Speed
Milwaukee 4K & 2K
Morey #12M Profiler, 2 sp. #2 Maximiller
Reed Prentice Vert. Mill & Die Sinker Mod. 3VG
Taylor & Fenn Vert. 6"x18"

TURRET LATHES

Bardons & Oliver #2, 3, 7 Bar Feed
Brown & Sharpe, #2 Hand, #10, 11
Foster #2B 2½ Cap. Morey #2G Late
Gisholt 2L, Cross Slid. Tur.
Gisholt #5, Bar Feed, Plenty of Tools
Gisholt 4R—9¼" hole in spindles
Jones & Lamson, Mod. 8A, No. 5
Libby 1 HS with threading att.—3R, 4R
Oster 601 WD. #2 Simmons Microspeed
Warner & Swasey #1, 1A, 2, 2A, 3, 4, 5

MILLS, PLAIN, UNIV. PROD.

New #2, Univ., Dividing Hd.
Brown & Sharpe #0 Omniversal, #000 Production

PRESSES

Bliss No. 1 Double Action Drawing Presses
Bliss 650 Hi-Production Presses
Bliss 18, 19, 21, OBI, 58, 62, 162, OB
Bliss 4½ Double Action, Roll Feeds, Cam (2)
Bliss #78½, 330 Ton SS, Bliss 74½
Bliss 5-48 Dbl. 32x48" bed, Cushion
Hamilton 850 Ton S.S. Bed 27x48
Hamilton 110 FM Die Tryout Press
New 85, 60, 55, 30, 20, 15, 10, 5 Ton O.B.I.
Niagara Horning, 15 Ton—Toledo 32 Ton Horning
Niagara A1¾, O.B.I., Niagara No. 27

PRESSES (Con't)

Stokes Tablet Presses, Mod. R, RD3, RD3S, DDS.
Toledo 29 Double Action Cam
V. & O. #102 O.B.I. Reducing
Walsh No. 3 O.B.I. 23 Ton, L1 #3
Z & H #4½, O.B.I. 20 Ton

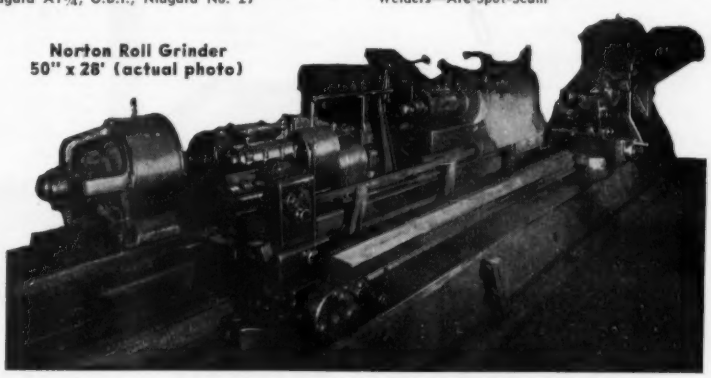
LATHES

American 12"x30", Bridgeford 36"x20", 32"x16'
Bertram 26"x10'
Boyes & Emmes—24" G.H.—Bradford 16"x36"
Gisholt Simplimatic 18"x16½", 2 Tables
Hendey 12"x42" and 12x30", 1941, 14" Yoke
LeBlond Regal 10"x3' bed, 13x42", 17" Late type
LeBlond 25/50x96" Gap, Late type.
Lipe-Carbo 12"x18" (2)
Lodge & Shipley #3A, Duomatics
Pratt & Whitney 16"x60, 10"x20", 16"x36
Monarch Magna-matic 14"x54"
New 16, 18, 20", 28" Immediate Del.
New Tool Maker 10x24", South Bend 9"
Rivett Model 918 Precision. Mod. 715
Putnam, Sliding Gap 22"/46"x92"
Sebastian 14"x6'
South Bend 13"x5' Q.C.G., 10"x3½ Taper Att.
Sundstrand 8x15", 15' Stub
Wickes 32"x35' Geared Head

MISCELLANEOUS

Band Saw: New Kalamazoo & Johnson
Bending Roll: Reed-Power 5"
Bolt & Pipe Threader: Landis, Oster-Williams
Broach: New 6 Ton. Horizontal. 11 Ton. Vertical
Hacksaw: Peerless 6"x6", Racine 6"x6"
Jig Borers: New Swiss
Keyseater: Davis, Baker
Pipe Bender, Kane & Roach, Parker tube 1½" Cap
PLANER: Niles-Bement-Pond 36x36'x10'; Gray 24"x24"x8', Detrick & Harvey 40x90"
Rotary Table: Cincinnati, Power take-off
Saw: Shaping 6x6", 13x13", Tannewitz Cut Off
Scrap Cutters & Granulator: Bell & Jewell
Shears: New 14x72, Niagara 10'x3/16", 12'x3/16"
Thread Miller, Coulter Hob, 1952
Welders—Arc-Spot-Seam

Norton Roll Grinder 50" x 28' (actual photo)



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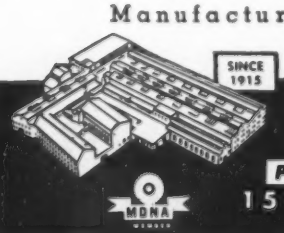

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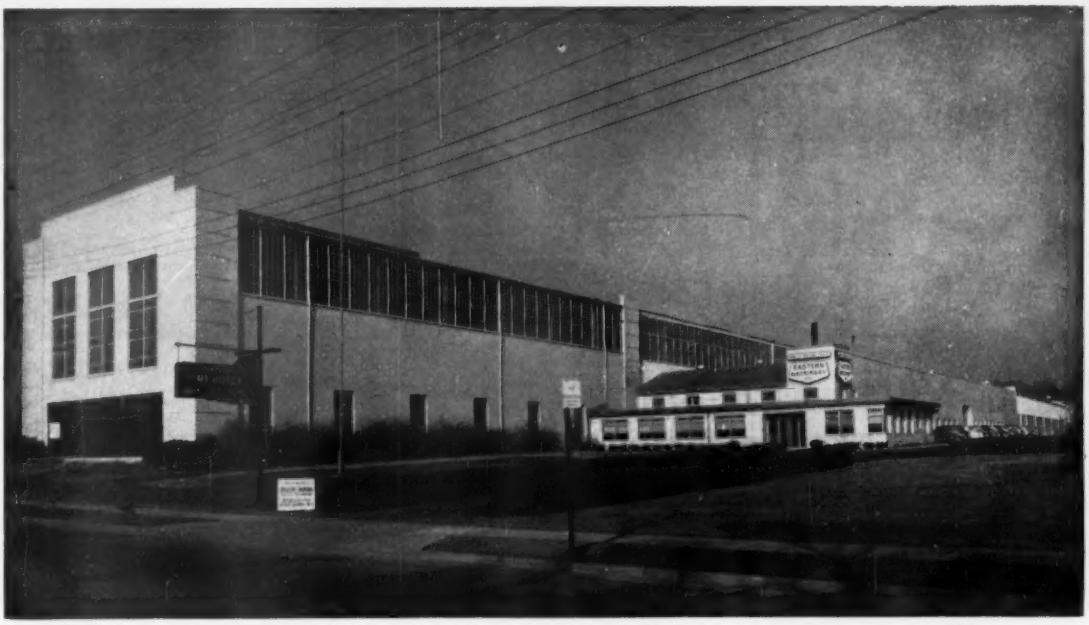

ENGINE LATHES

19"x4' centers LeBlond, m.d.
19"x6' bed LeBlond Geared Head, m.d., later type
19"x10' bed LeBlond H.D., m.d.
19"-38"x10' bed LeBlond Gap Lathe, cone, motorized, taper
20"x8' bed American Geared Head, m.d., taper
20"x8' Cisco, cone, motorized
20"x8' bed Greaves-Klusman Geared Head, m.d. in leg
20"x8' bed Boye & Emmes, m.d.
20"x8' bed Lodge & Shipley Geared Head, m.d., taper, later type
20"x10' bed (6' centers) Sidney Geared Head, m.d., taper
20"-40"x9' bed Rahn-Larmon Gap Lathe, cone, motorized
20"x10' Sidney Geared Head, m.d.
20"x10'6" Boye & Emmes, cent, motorized
20"x10'6" bed Sidney "Tritrol" Geared Head, m.d., late
21"x8' bed LeBlond Geared Head, m.d., taper
24"x7' centers American, m.d.
24"x12' LeBlond Geared Head, m.d., taper
23"x12' bed LeBlond, cone, motorized
24"12' bed Boye & Emmes, belt drive
24"x12' Bridgeford Geared Head, m.d., taper
24"x16' bed Lodge & Shipley, cone, motorized, taper
24" raised to swing 32"x22' bed—16' centers New Haven, cone, taper
25"x10' bed LeBlond Geared Head, m.d., taper
30"x5½' Betts-Bridgeford, m.d.
30"x12'6" bed Niles-Bement-Pond, variable speed m.d., taper
30"x40' bed (33' centers) Betts-Bridgeford Heavy Duty Hollow Spindle, "Oil Country" type, m.d.
30"x13'6" bed Niles-Bement-Pond, m.d.
36"x84" centers American "Super-Productive", m.d.
36"x16'6" bed Boye & Emmes Geared Head, m.d.
36"x18' Putnam, m.d.
42"x14' bed American Geared Head, m.d.
42" Putnam raised to swing 56½"x20' bed Geared Head, m.d., 11'6" centers
42"x108" centers LeBlond Heavy Duty Geared Head, m.d., taper, late type
42"x180" American Super-Productive Lathe, m.d., taper
40"x108" centers LeBlond Geared Head, m.d.
48"x20'6" bed Niles-Bement-Pond, m.d.
48"x33' centers Niles-Bement-Pond, m.d.
63"x7' centers I. H. Johnson, m.d.
72"x7' centers I. H. Johnson, m.d.

RAILROAD MACHINERY

No. 2 Niles-Bement-Pond Double Head Axle Lathe, m.d.
No. 3 Niles Axle Lathe
48" Niles-Bement-Pond Car Wheel Borer, m.d.
90" Niles Balanced Quartering & Crank Pin Turning Machine, latest
90" Putnam Driving Wheel Lathe, m.d.
90" Niles Journal Lathe, including 2 inside journal journal turrets and 3½" spindle double quartering attachment, m.d.
90" Niles Driving Wheel Lathe, m.d., latest
Niles-Bement-Pond Quartering Machine, m.d., new

VERTICAL BORING MILLS

36" Bullard, m.d.
42" Bullard Spiral Drive, m.d.
42" Bullard New Era, m.d.
42" King, with side head and plain swivel head on rail
44" Putnam, m.d., p.r.t.
44" Niles, m.d., p.r.t.
48" Colburn, m.d.
48" Niles-Bement-Pond Car Wheel Borer, m.d.
53" Niles Heavy Pattern, m.d., p.r.t.
73" Niles, m.d., p.r.t.
100" Niles Heavy, m.d., p.r.t.
102" Niles Wheel Turning Boring Mill
12' Niles, m.d., p.r.t.
108" Cincinnati Vertical Hypro Vertical Boring Mill

RADIAL DRILLS

2' Fosdick, m.d.
2½'-10" col. American Triple Purpose Plain, m.d.
3'-10" col. American Triple Purpose Plain, m.d.
3'-10" col. Morris, m.d.
3'-13" col. American Triple Purpose Plain, m.d., hex table
4'-11" col. Cincinnati Bickford, m.d.
4'-13" col. Cincinnati-Bickford Super-Service, m.d.
4'-13" col. American Triple Purpose Plain, m.d.
5'-13" col. American, gear box, m.d.
5'-14" col. Carlton, m.d.
5'-15" col. American Triple Purpose, m.d. on arm
7'-16" col. American Triple Purpose, m.d.
8'-17" col. Dreses, gear box, m.d.
8'-19" col. Cincinnati-Bickford Super Service, m.d.
Zowe Precision Universal Bench Type Radials, m.d., new
Baush Radial Drilling & Tapping Machine, m.d.

PLANERS

P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.
20"x20"x5' Whitcomb-Blaisdell Planer, 1 head, m.d.
24"x24"x5' G. A. Gray Planer, belted m.d., 1 head on cross rail
24"x24"x6' G. A. Gray Planer, belted m.d., 1 head on cross rail
30"x30"x8' Cincinnati Double Housing, 2 rail heads
30"x30"x10' Cincinnati, belted m.d., 2 heads
36"x36"x8' Cincinnati, 2 heads, m.d.
36"x36"x10' Betts, belted m.d., 2 heads on rail, 2 side heads
36"x36"x10' Gray, Extra Heavy Pattern, m.d., 2 heads on rail
36"x36"x10' Niles-Bement-Pond, belted m.d., 1 head on cross rail
36"x36"x12' Betts, m.d., 2 heads
36"x36"x18' Niles-Bement-Pond, 2 heads, variable speed m.d.
36"x36"x20' Cincinnati, 2 heads, belt
36"x36"x20' Gray, 2 heads, belt
36"x36"x12' G. A. Gray, reversing m.d.
42"x42"x14' Niles-Bement-Pond, reversing m.d., 2 rail heads
42"x42"x28' G. A. Gray, 2 heads, belted m.d.
48"x48"x18' Niles-Bement-Pond, 2 heads, belt
48"x48"x18' Detrick & Harvey, 4 heads, reversing m.d.
48"x48"x28' Cincinnati, reversing m.d., 4 heads
56"x42"x14' Cincinnati, belted m.d., 2 heads
72"x72"x36' Niles, 4 heads, reversing m.d.

THE EASTERN MACHINERY COMPANY
1004 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241
CABLE ADDRESS EMCO

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MACHINERY COMPANY

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Specializing in the purchase and sale of machine tools, metal working machinery, industrial plants and equipment. Associated with Mr. O'Brien is MR. DONALD A. DUNCAN, JR., former Asst. Vice-President of the O'Brien Machinery Company's machine tool division.

A PARTIAL LISTING OF MACHINERY NOW IN STOCK

4' 13" Cincinnati Bickford "Super Service" Radial Drill, '42
#1836 Kearney & Trecker Simplex Production Mill, '42
#08 Cincinnati Horizontal Milling Machine, '42
#1H5 Libby 24" Turret Lathe, taper, cross-sliding turret, '41
#24 Gardner 53" horizontal disc grinder. 20 HP., late
Clark Univ. Ironworker, cuts bars, angles, punches
#56 Consolidated 90 ton Trimming Press, side shear, M.D.
#54 Cleveland 125 ton S. S. Geared Press, M.D.
#89 Zeh and Hahneman 80 ton S.S. Geared Press, M.D.
16"/24" x 48" c.c. Meuser Gap Lathe, taper, like new, '51

MDNA
MEMBER

FINE LATE TYPE GUARANTEED TOOLS

16"x78" centers PRATT & WHITNEY Model "C" Toolroom Lathe, taper attachment, chucks, new 1943

28"x15' centers BERTRAM (Niles patterns) "Timesaver" Engine Lathe, 2 carriages, rapid traverse, AC-MD, new 1943

36"x12' centers AMERICAN Heavy Duty 16 Speed Geared Head Lathe, AC-MD

60"x20' NILES-BEMENT-POND Geared Head Engine Lathe, rapid traverse

No. 1L GISHOLT Saddle Type Universal Turret Lathe, preselector head, bar feed, chuck, new 1943

No. 1A WARNER & SWASEY Universal Turret Lathe, Timken spindle, electric chuck

No. 2A WARNER & SWASEY Universal Turret Lathe, preselector head, bar feed, chuck, new 1943

No. 3A WARNER & SWASEY Turret Lathe, Timken spindle, electric chuck, tooling

No. 2 VAN NORMAN Plain Horizontal Mill, New 1943

No. 2CH KEARNEY & TRECKER Vertical Mill, new 1951

No. 3-24 CINCINNATI Plain Hydromatic Mill, AC-MD

No. 4 KEARNEY & TRECKER Plain Horizontal Mill, No. 50 taper, motor in base, rapid traverse

No. 4 CINCINNATI High Speed Dial Type Plain Horizontal Mill, new 1942

No. 4 CINCINNATI High Power Dial Type Vertical Mill, 25 HP motor, new 1951

No. 4H KEARNEY & TRECKER Vertical Mill, new 1944

48"x48"x10' NILES Double Housing Planer, box table, DC reversing motor drive.

48"x48"x12' Cincinnati Double Housing Planer, power rapid traverse, DC reversing motor drive, box table, forced feed lubrication.

48" widened to 69"x12' DETRICK & HARVEY Double Housing Planer, box table, DC reversing motor drive

No. 2 BROWN & SHARPE Surface Grinder, motor inside base, power feeds

25A Heald Rotary Surface Grinder, 24" diameter magnetic chuck, AC-MD

1½" LANDIS Bolt Threader, leadscrews, AC-MD

30" MORTON Hydraulic Keyseater, new 1942

600 Ton CHAMBERSBURG Wheel Press, cast steel frame, inclined, AC-MD

3'9" Column AMERICAN Radial Drill. AC Motor on arm. New 1943.

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SAVE 50% ON NEW HIGH SPEED TAPER SHANK END MILLS

Right Hand Spiral Flute End Mills with Brown & Sharpe Taper Shanks

7/16 Dia. #5 B&S Taper $1.50 ea. net
½ Dia. #7 B&S Taper 2.00 ea. net
¾ Dia. #7 B&S Taper 2.50 ea. net
1 Dia. #7 B&S Taper 3.50 ea. net
1½ Dia. #9 B&S Taper 6.50 ea. net
1¾ Dia. #9 B&S Taper 8.00 ea. net

High Speed Extra Long Flute End Mills. R.H. Cutter, 1" Dia. #9 B&S Taper 6" Flute Length, Left Spiral Flute . . . $5.00 ea. net.

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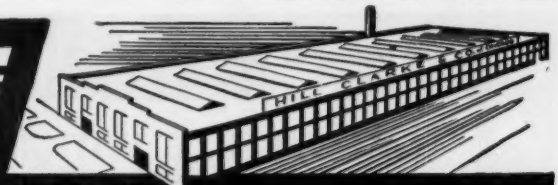


ESTABLISHED 1867 · W. L. DITFURTH, President · T. H. PRICE, Vice President · E. R. MONS, Secretary

Partial List

Automatics

1-1/16" Cleveland Model A (1942).

Boring Machines

No. 45—4½" Gidd. & Lewis Hor. Bar.
100" Niles-B-Pond Vert. Bor. Mill.

Drills

No. 2 Avey Cam Fd. Drill. 14" Swing.
2 Spdl.—24" SW.—No. 3 Avey.
D-31 Fox Multiple.
No. 57H Fox 24 Spindle Multiple Drill (1943)
1 Spdl.—30" Sw. No. 4 Taper Aurora.

Gear Machines

11" Gleason Gear Generator.
No. 12HS Gould & Eberhardt.
No. 36-BM G. & E.—3 spdl. Rougher.
615-A Fellows Gear Shaper.
612-A Fellows Gear Shaper.
No. 64 Fellows Gear Shaper.

Grinders

6" x 18" Landis Type C (1942).
6" x 18" Norton Type C Plain (1943).
10" x 36" Norton Type C Grinder.
10" x 36" Norton Type C cam Grinder.

Internal Grinders

No. 1109 Bryant Internal Gdr. (1951).
No. 5 Bryant Internal Grinder.
No. 5B Bryant Internal Grdr.
No. 16-16 Bryant Int. Grinder.
No. 16A-16 Bryant Internal Grinder.
No. 16-28 Bryant Int. Grinder.
No. 16 A-28 Bryant Internal Grinder.
No. 24-26 Bryant Int. Grinder.
No. 24-36 Bryant Internal Grinder.
No. 81 Heald Internal Centerless.

Hill-Clarke Norton Type Motor Driven Grinders

10" x 36" Centers. 14" x 36" Centers.
10" x 72" Centers. 14" x 50" Centers.
10" x 96" Centers. 14" x 72" Centers.
18" x 96" Centers. 14" x 96" Centers.
18"-30" gap x 96" Centers.
24" x 264" Centers.

Hones

Model H-2 Micromatic Horiz. Hone.
Model 200-H5-Dbl. End Micro. Horiz.
Model H-7 Micromatic Vert. Hone

Lathes

R-14 Lo Swing Automatic Lathe.
18" x 6' Am. Geared Head Lathe.
18" x 8' Lodge & Shipley Grd. Hd.
27" x 12' American Geared Hd. Lathe.
27" x 12' centers LeBlond Lathe.
36" x 18' Putnam Grd. Hd. M.D.

Turret Lathes

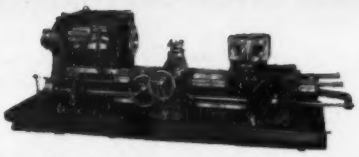
No. 5W Acme Tur. Lathe (Late).
No. 3AL Gisholt, Cross-Slide Turret.
No. 4A Warner & Swasey Turret.
No. 6 Warner & Swasey, cone head.
2¼" x 24" Jones & Lamson.
18" Libby, M.D.
No. 4A Warner & Swasey (1944).
No. 4A Warner & Swasey, Taper, Cross-sliding Turret (1942).

Planers

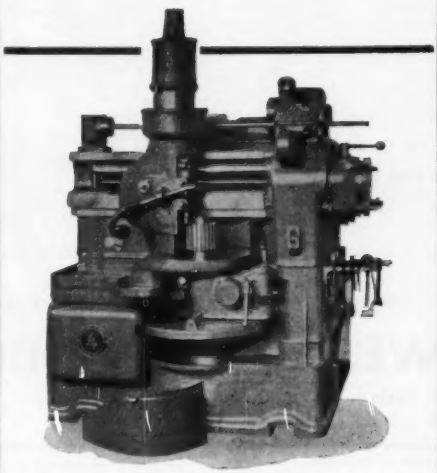
48" x 36" x 14' Gray, 2 Heads.
48" x 48" x 12' Cincinnati, 2 Heads.
60" x 48" x 27' American, 4 Heads.

Milling Machines

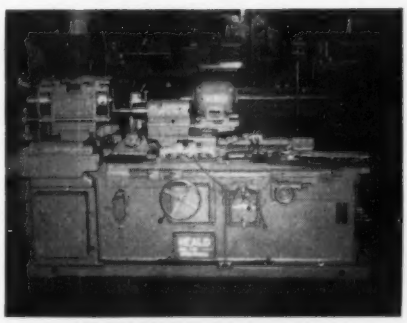
54" Ingersoll Vertical Adjustable Rotary Mill.
No. 3K Milwaukee Vert. Mill (1942).
No. 08 Cincinnati Vert. (1942).
No. 12 Cincinnati Pl. Auto.
4" Taylor & Fenn Duplex Spline.
6" x 168" Pratt & Whitney Thrd. Mill.
10" x 48" Hanson-Whitney Thrd. Mill.
10" x 60" Pratt & Whitney Thrd. Mill.
12" x 102" Mod. HT Lees Bradner Thrd. Mill.
54" x 30" x 16' Ingersoll Slab Mill.
No. 34-36 Cincinnati Hydro.



No. 3AL GISHOLT UNIVERSAL HEAVY DUTY TURRET LATHE, 20 HP AC Main motor, hard steel ways, cross sliding turret 27" swing, *Serial No. 929-19 (1941)*



No. 615A Fellows Gear Shaper, 3 HP. A.C. Motor-in-base, capacity 18" Pitch diam. x 5" face. *Serial No. 16513*



NO. 74 HEALD CENTERLESS INTERNAL GRINDER 7½ Hp. 220/440 volt Main Motor, A.C. Hydraulic, Wheelhead- and workhead motors, 21" Swing. *Serial No. 24603*

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CUSTOM REBUILDING ON CUSTOMER-OWNED MACHINES!

We inspect your machine and furnish you with a fixed price quotation on work to be done — you know your maximum cost before any work is started.

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PARTIAL WAREHOUSE INVENTORY (*INDICATES LATE TYPE MACHINE)

AUTOMATICS
*1-1/16" Foote Burt 1 Spdl., 1941
*00G B. & S. w/V slide, 1942 & 1945
0G B. & S. w/V slide, 1937 & 1942
*2G B. & S. Automatics, 1942 & 1948
*9/16" RA6 Acme Gridley, 1942 (3)
*1" No. 60 New Britains, 1942 (2)
*1¼" RA6 Acme Gridley, 1943

BOREMATIC
*Excello Dbl. End 4 spdl. w/Refrig.
*Simplex Proc. Hydr. 2 & 4 spdl. models (8)

BRAKES
*8'x16 ga. Whit-Jenson, box & pan
*4'x14 ga. Lynn Hydr. 5 H.P. (rebuilt)
*4'x18 ga. D. & K. No. 131, ¾ H.P.

BROACH
*V-1 2 ton American Vertical, 3 H.P., like new

DRILLS
*21" Canedy-Otto No. 3 Mt. 1 H.P.
*18" Buffalo 1 spdl., ⅔ H.P.
*A-23 Natco horiz. deep hole, 1½"x40" cap.

DRILLS, MULTIPLE SPINDLE
D-5 Natco 10 Spindle, Adj. Spdl. (1936)
6 Spdl. Leland-Gifford Motor Drive Spindles, 1937
8 Spdl. Bausch No. 2 Taper motorized
12" Leland-Gifford 2 spdl., 4 speed, 440 V.
*12" Delta 4 spdl. (4) 1 H.P. motors
*24" Fosdick No. 4BM 2 spdl. H. feed (3)
*24" Fosdick No. 4BM 3 spdl. H. feed & pwr. feed (6)
*26" Fosdick No. 5BM 2 spdl. P. feed, like new

FURNACES
*166 KW Ajax-Tama-Wyatt Low Freq. Indust. type
*Holden Gas Pot Type w/2 pots, 1943
*Mahr 18x18 gas fired, salt bath
*30 KW Leeds Northrup Home-Carb

GRINDERS
*Fitchburg H.D., Plunge Cut, w/Dewgage, 1948 (2)
*#2 Cincinnati Universal, tool & Cutter, w/ diagonal access (1942.)
*3x12 Landis Cam Grinder w/wheel feed, 1948 (2)
*10x24 Landis Univ w/int.-ext. attsh. Rebuilt, (1942)
*No. 5 Bryant Internal, like new
*4x12 Landis Hydr. Cyl., w/plunge (2)
*No. 2 Oliver Autom Face Mill Grinder, 5-16" cap.
*No. 112 Rivett Ext. & Int. attach., lots access.

GRINDERS, SURFACE
*6x18 No. 1½ Abrasive w/chuck & coolant (2)

HONES
*H7 Micromatic Vert. Hydrohoner w/micromatic table & Barnes Magnetic separator
*No. 224 Barnesdrill Honer, Vert. 1 spdl. w/ cycling attach. & Barnes Magnetic separator

LATHES
*7" Pratt & Whitney Bench Lathe, Proc.
*8" Cincinnati polishing lathes, w/chucks, 1943
*9" Hardinge "Cataract" w/collet attach.
*9" Logan w/2 chucks & access.
*10" Rivett Proc. Toolmakers w/access.
*10" Sheldon L-44 w/turrets, collets, etc.
*10x4' South Bend Q.C. tr. model
*11x36 Sheldon TR mod. 3 J chuck
*12x48 Sheldon TR mod. w/access.
*13"x6' South Bend Model 113C w/chucks
*14x18 Lipe Carbo-Matic clean, 1943
*14"x30 Lodge & Shipley T.R. Mod.
24x86" LeBlond Q.C. motorized
*27x84" cc Monarch w/T.A. chucks
*#12 Gisholt Automatic, complete, 1948

LATHES, TURRET
*DV 59 Hardinge 2nd operation, level turret
*No. 601 Oster Hand Screw, 1½" hole, 1942
*No. 3 Mercy Univ. 1½" cap. coolant & access (1945)
*No. 4 W. & S. Univ. Preselector w/air chuck
*No. 2A W. & S. Preselector w/chuck & tools, 1943
*Foster 5U-w/Bar feed & tooling

MILLS
*No. 3V Van Norman Vert. w/vise, 1942
*No. 3K K. & T. vert., 1941, real clean
*2H K. & T. Vert., real clean, 1943

MILLS, PRODUCTION
*0-8 Cinc. Vert. w/std. table, 150-1300 R.P.M.
*No. 00 Sundstrand Horiz. Rigidmill
*1-14 Kent Owens Hydr. 9x32 table
*1-18 Cinc. Horiz. Hydr. rebuilt
*2-20 Kent Owens Hor. Hydr. 12x42 table (2)
*34-3 Cincinnati Horiz. Duplex w/R. & F. spdl.
No. 33 Simplex Horiz. 50" table, 5 H.P.
*28-84 Cinc. Horiz. Hydrotel 15 HP
*360° Cinc. 4 spdl. Profiler 1942
*36-72 Cincinnati, Horiz Hydrotel, exc. cond. (1942)

PUNCH PRESS
*36-51 Ton No. 164 Bliss D. A. Shell Press
*No. 58 Bliss ORD 4" Str. Adj.
25 ton Henry & Wright, Hi-speed Prod. type (2)
10 Ton No. 1½ Toledo w/index table

SPOT WELDER
*28 KVA Taylor Winfield w/timer
75 KVA Dyer w/electronic controls

MISCELLANEOUS TOOLS, ETC.
*M-60 Megullizer, Metalizing set up, complete, (1951)
*#11, Warner & Swasey Pros. Tapper ⅞" cap, 1948
*Schmidt Marking Machine, 1949 model
*Y-109 Ekstrom-Carlson Radial Arm Router drill 2-5 HP Spls, (1951)
Washer, Hoffman Ind. Rag Washer (2) 35 x 54" Chamber Bbl. 3 HP
*Dynamometer No. 66 B Dynamatic 12 HP
No. 3 Famco Arbor Press

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Brown and Sharpe Hobber, No. 44, serial No. 104 with Crocker Wheeler Motor, serial No. 748275. Equipped to cut spur and spiral gears and splines.

Schuchardt and Schutte Hobber, 36" CAP TP #2, serial No. 6706. Equipped with differential for cutting spur, spiral, and worm gears.

60" Reinecker Hobber, RF No. 4N, Serial No. 6937/1. Completely rebuilt. Equipped with Tangential feed and differential.

These hobbers now being used in production and in excellent condition. Can be seen in operation.

1—Monarch Lathe 12" and serial No. CK 3919.

1—Monarch Lathe 14", serial No. C-5239.

All of the above equipment motorized, 220 volts AC, 3 phase.

FS-8480, AMERICAN MACHINIST
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No. 2 B & S High Speed Autos. M.D.
No. 25 Heald Rotary Surface Grinder.
P & W 30" Vert. 2-spindle Profiler.
Peerless 6½ x 6½ Hack Saw, hyd.

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4357 St. Paul Blvd., Rochester 17, N. Y.

PLANER TYPE MILLING MACH.

Newton heavy duty planer type milling machine. 4 heads. Capacity 96" x 87" x 28'. New 1939. Priced to sell.

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ACME GRIDLEY R6, 1⅝", 6-spindle; late type
ACME GRIDLEY RA6, 9/16" cap. 6-spindle, late
***CLEVELAND 5¾" Model "A" M.D., late**
***CLEVELAND "B" Model "A", M.D., late**
***CONOMATIC 4⅛", 4-spindle, M.D., late**
GYROMATIC Model 40, 2⅝" 6-spindle; late

BORING MILLS—Horizontal
***EX-CELL-O No. 1212A Boremetic, double end, double spindle; late type**
***EX-CELL-O No. 17 Boremetic, double end, double spindle; late type**
NILES 8" bar; floor type; motor drive
LANDIS No. 35 Floor Type; late
LUCAS 3" Bar, motor drive, late type

BORING MILLS—Vertical
***BULLARD 24", spiral drive, M.D., late type**
***BULLARD 54" Vertical, PRT, motor drive, late**
***CINCINNATI 96" Vertical, Motor Drive**
NILES 53", 2 swivel heads, PRT; MD.
NILES 100", 2 swivel heads, PRT., M.D.

BRAKES and SHEARS
BESCO 16 gauge 60" Press Brake; NEW
BESCO 36", 20 gauge Power Sq. Shear; NEW
BESCO 48" x 14 gauge Power Sq. Shear; NEW
BESCO 72" 14 gauge Power Sq. Shear; NEW
CHAMBERSBERG 500 HP, Billet Breaker; late type
QUICKWORK No. 5 Rotary Shear ⅜ cap. M.D.
QUICKWORK No. 6 Rotary Shear 1" cap. M.D.
WORMSER T-15; T-25; T-30; Ironworker; NEW

BROACHES
***CINCINNATI I-30 Duplex Vert. Hydr.; late**
***COLONIAL VGI-10-48 Vertical, Hydraulic, Late**
LaPOINTE 10-54" Single ram type, late
OILGEAR 3XA Horiz. Hydraulic; late

DRILLS—Miscellaneous
ALLEN No. 3 4-spindle, 4 motor drive, 12" overhang; No. 4 M.T. late
BARNES No. 420 Deep Hole; late
***BARNES H2 Hydram Cap. 2" 5 M.T. hyd. late**
BARNES 20" 4-spindle Camel Back No. 4 M.T.
CINCINNATI 21" round column; M.D.; late
LELAND & GIFFORD No. 1 LMS Sgle. Spdle. late
MOLINE 6-spindle Mult. Hole-Hog; 3¾" dia. M.D.

RADIAL DRILLS
AMERICAN 4' arm 11' col. "Hole-Wizard"; late
***AMERICAN 5' arm 13" col. "Hole-Wizard"; late**
CINCINNATI BICKFORD 6'15" Universal: M.D.

GEAR CUTTING EQUIPMENT
BARBER COLMAN Type A Gear Hobber late type
BROWN & SHARPE No. 6-72" Auto. Cutter; M.D.
CROSS Nos. 1, 40, 45 Gear Tooth Rounder; M.D.
DETROIT Type GG 35 Gear Grinder late type
***FELLOWS Nos. 61A, 6Z2, 75, 7A, 77. High Speed Gear Shapers; Late**
FELLOWS No. 48 H. S. Gear Shaper: late type
FELLOWS 13LS Lapper; motor drive; late
GLEASON No. 12 Tool Sharpener; late
GLEASON 12" Straight Bevel Gen.; late
GLEASON 3" spiral bevel gear gen. M.D.
GLEASON No. 4 Tester; late
GLEASON 11" & 18" Bevel Gear Gen. M.D.
GLEASON No. 13 Hyp. Cutter Sharpener late type
GLEASON No. 14 Spiral Bevel Hypoid Grinder, late
GLEASON No. 15 Quenching Press late type
***GLEASON No. 17 Bevel Gear Grinder; late**
GLEASON 18" Bevel Gear Tester and Lpr., M.D.
***GLEASON 24", 37" Bevel Gear Planers, M.D.**
***GLEASON 25" Gear Generator, M.D.; late**
GLEASON No. 24 Straight Bevel Generator, M.D.
GLEASON No. 6 Revacycle, late type
GOULD & EBERHARDT 12H Gear Hobber late type
GOULD & EBERHARDT 18H Gear Hobber M.D.
***GOULD & EBERHARDT 120-H M.D., late type**
GOULD & EBERHARDT No. 36BM M.D.
MICHIGAN Gear Finisher. Md. 862-24-A, 24" late
MICHIGAN Model 854 Gear Shaver Rack Type M.D.
PRATT & WHITNEY 10" Gear Grinder; late

GRINDERS—Internal
BRYANT Nos. 3 & 5 internal; hydraulic; late
BRYANT No. 16-C-16 Internal; hydraulic; late
BRYANT No. 24 Internal; hydraulic; late
CHURCHILL No. 3 internal; stroke 8"
HEALD No. 70A Internal; M.D., late
HEALD No. 81 pl. chuck type internal; M.D.
***HEALD No. 72-A3, 72A5 Plain Internal, late**
HEALD No. 72-A-5 "Gagematic" Internal; late
HEALD No. 78 Internal Centerless; M.D.

GRINDERS—Cyl. Plain & Universal
BROWN & SHARPE No. 1, motor drive, late type
BROWN & SHARPE No. 3 Universal late type
BROWN & SHARPE No. 5 3" x 12" Plain late
***CINCINNATI 10"x48" Plain; late type**
LANDIS 10" x 18" type C, plain hydraulic, late
***LANDIS 14"x72" Type "C", Plain Cyl., late**
NORTON 4" x 12" model CTU Plain, year 1953
NORTON 6" x 18" type "C" Plunge Grinder; late
NORTON 10"x48" Type "C" Hydr. Plain Cyl.; late
VAN NORMAN No. 666, 48" centers, crank shaft

GRINDERS—Surface
ABRASIVE No. 34 8" x 24" table late type
ARTER 8" Rotary, motor drive
BILLITER & KLUNZ 48 x 196" Way Grinder; M.D.
***BLANCHARD No. 11 16" chuck late type**
BROWN & SHARPE No. 2 late type
HEALD No. 22 Rotary, 12" chuck; M.D.; Late

HEADERS AND UPSETTERS
AJAX 3½" Upsetter, motor drive
MANVILLE Nos. 2 & 3 DSOD, M.D., Reheader
MANVILLE No. 1A, DSSD, Motor Drive
WATERBURY FARREL No. 11, DSSD, Motor Drive

LAPPING MACHINES
LeBLOND No. 2 Barrel Lapper late type
NORTON 10-U Vertical Lapper late type
SCHRANER Model A 12" x 35" c.c. Shaft Lapper
ULTRA LAP No. 10 Flat Lapping late type

LATHES—ENGINE & MFG.
AMES Bench Lathe, motor drive, late
DENHAM 12 x 54" centers, Gap; late type
DENHAM 16 x 72" centers, Gap; late type
HENDEY 16/24" x 36" centers, M.D., late type
HENDEY 16" x 42" centers, M.D., late type
HENDEY 16" x 54" centers, M.D., late type
LeBLOND Mod. 7ACL Crankshaft; M.D.
LEHMANN 16" x 30" centers; Timken; M.D., late
LODGE & SHIPLEY 14" x 30" Centers, late type
LODGE & SHIPLEY No. 5-24" and 96" centers; DUOMATIC; Timken; Late
LoSWING 4 x 60", 4 x 84", 8 x 60", 8 x 108"; Late
MICHIGAN Model 1712 Universal Relieving Machine 12" x 32" centers late type
MONARCH 12" x 30" centers Model CKK late
MONARCH 14" x 42" centers "Z" Magnamatic Auto. TIMKEN, M.D. Late
***MONARCH 10" x 20" model EE, M.D., late**
NILES, 30" x 46", Boring; "Time Saver" late type
PRATT & WHITNEY 16" x 30" Centers, late type
REED PRENTICE 14" x 54" c.c. Model B Timken
SUNDSTRAND 10 x 60" Centers; Auto. Late Type
SWIFT 16" x 72" Centers, late type
U.S. Model 810B Cutter Reliever 8" capacity late

LATHES—Turret
GISHOLT 2L High Production, Timken, M.D., late
GISHOLT 1L Univ. Saddle Type; Timken; M.D. late
MOREY No. 2, ram type TIMKEN; Late
***WARNER & SWASEY No. 5 Universal ram type, Preselector head; year of manufacture 1953**

MILLING MACHINES—Thread
HALL style D Planetary; Late
LEES BRADNER Model HT, 12" x 36" centers, late
MOREY 12" x 30" and 12"x160" centers, late type

MILLING MACHINES—Plain
CINCINNATI 1-18 Automatic, Timken, late type
***CINCINNATI No. 4 Dial Type; Timken; late**
KEARNEY & TRECKER Mod. 2HL; M.D.; Late
***KEARNEY & TRECKER Mod. 3CSM, PRT; late**
KEARNEY & TRECKER 4H Plain, Timken, late type
ROCKFORD No. 3, Rigid Mill, Motor Drive
STARR No. 2, Table 13" x 55", late type

MILLING MACHINES—Universal
CINCINNATI No. 3 Univ., dial type, Timken, M.D.
RICHMOND No. 1½ light type; late
***VAN NORMAN No. 26 Ram Type Miller; late**
***VAN NORMAN No. 36 Ram Type Miller; late**

MILLING MACHINES—Vertical
CINCINNATI 0-8 Vertical, Timken, late type
CINCINNATI No. 3 Vertical; Timken; late type
***KEARNEY & TRECKER No. 4CH Timken, late**
KEARNEY & TRECKER 3H Vertical, Timken, late
***KEARNEY & TRECKER 3K, Timken, late**

PLANERS
***BETTS (CONSOLIDATED) 108"x84"x44"; 4 heads; PRT; Box Table; M.D.**
DETRICK & HARVEY 48" x 48" x 16', 4 heads hyd.
GRAY 36" x 36" x 10' "Maximum Service" 4 hds.; PRT DC Motor Drive
GRAY 24" x 24" x 6'; motor drive
***LIBERTY 144'x76"x48' adj. variable openside; Box Table; 4 heads; PRT; M.D.**
NILES 48" x 48" x 12' Time Saver, 3 heads, late
***NILES 108"x84"x42' 4 heads; rapid traverse; box table; DC M.D.**
NILES BEMENT POND 72" x 72" x 30' 4 heads; Rapid Traverse; M.D.
NILES 48" x 48" x 10' double 4 hds; PRT, M.D.

SAWS
CAMPBELL No. 401 Abrasive Cut Off, late type
PEERLESS 6" x 6' Hack Saw, Auto. Bar feed

PRESSES
BIRDSBORO 325 ton, 31 x 31 between uprights, hydraulic
BESCO No. 18, 10 ton capacity, OBI, NEW
BESCO Model EB2, 18½ ton Back Flywheel, NEW
BESCO Model EB4, 40 ton cap., Back Flywheel New
BESCO No. 21, 40 ton capacity, OBI, NEW
BLISS No. 6 Straight Side, 135 ton capacity, 100" between uprights, Motor Drive
***BLISS 525-ton No. 410A double action toggle drawing press**
NILES 48" Horizontal Wheel Press, Hyd., M.D.
SHAW 250-ton hydr. flanging press; late
WATERBURY FARREL No. 9, 125 ton capacity Blanking Press, motor drive

TAPPING MACHINES
BAUSH No. 1 Radial Tapper, late type
WATERBURY FARREL No. 2 Automatic, late

MISCELLANEOUS
ALEXANDER No. 2, 3-dim. Engraving, NEW 1952
BAKER No. 5 Keyseater; motor drive
BARNES No. 172, 214 Honing; M.D. hydr.; Late
FISCHER No. 1 Oil Groover; M.D.; Late
GORTON 3K Precision Matrix Engraving, late type
LANDIS 2" Double Spdle. Threaders
LeBLOND No. 2 Deep Hole Reaming, late type
LeBLOND No. 2 Deep Hole Rifling, late type
MANVILLE No. 3, Bolt Head Trimmer, M.D.
MANVILLE 2C, Screw Slotter, Motor Drive
MANVILLE No. 1, Screw Slotter, Motor Drive
SCIAKY Type BMCO 45-10 Elec. Spot Welder
HUGH SMITH 1" x 24'6" Plate Bend. Rolls M.D.
VAN NORMAN No. 639 Osc. Radius Grinder
WATERBURY FARREL No. 10 Thread Roller, M.D.

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LATHES

Gisholt No. 2L Universal—Cap. 4½" round—Cross sliding turret—Threading—Arranged for chucking—MD—Late type

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Warner and Swasey No. 3A Universal—Hole through spindle 6"—Arranged bar and chucking—Misc. equipment—MD—Late Type

American 36" x 13' ctrs. Engine—Geared head—MD—1943 machine—12 speeds, range 9 to 400 RPM

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Cincinnati No. 4 Vertical Dial Type—Range 42" x 16" x 16"—Table 16¼" x 78½"—No. 50 taper—MD—Late type

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Reed-Prentice No. 5 Vertical Miller and Jig Borer—Range 48" x 16" x 15"—Table 16" x 68"—18 speeds, 17 to 600 RPM—MD

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TG615 Jones & Lamson Thread Grinder—Late—Excellent
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#36 Van Norman Miller
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12" x 42" Hendey, 12 speed geared head late model tool room, Cam Loc Timken bearing

Model 3A Warney & Swasey, serial 502273, late model, extra long bed, Timken bearings, air chuck and cylinder

Model 1H5 Libby saddle type, rapid traverse, late model

MILLS

No. 2LU Van Norman universal, 1942

No. 3K Kearney & Trecker, high speed dial type

No. 4K Kearney & Trecker, plain horizontal, medium speed dial type

GRINDERS

No. 2 Cincinnati centerless Filmatic

10" x 18" Cincinnati plain cylindrical Filmatic

10" x 24" Landis universal, 1945

Model 120A Gardner double spindle opposed disc, 1946

12" x 48" Model 300 Hanchett vertical spindle surface, 1942

GEAR MACHINERY

No. 3 Barber Colman hob sharpener

Type A Barber Colman hobbers

Gould & Everhardt universal hobbers

72" Schuchardt & Schuette universal hobber

100" x 24" Newark No. 7 spur gear cutter

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ALLEN: No. 2 Drill—6 Spindle, 3" overhang
ALLEN: #2 High Speed 15"
PRATT & WHITNEY: ½B x 50 Deep Hole Drilling & Reaming Machine, 2-spindle
RADIAL DRILLS: Archdale, 5', 6' and 7', new

GEAR MACHINERY
FELLOWS: 61A Shaper, 18" dia.
FELLOWS: 64A Shaper, 18" dia.
FELLOWS: Flat Top Helical Gear Cutter Grinder
FELLOWS: Straight Line Generator, 3" dia. with many cutters
GLEASON: #12 Rough & Finish Gen.
GLEASON: 3" Straight Bevel Gear
SYKES: Rack Cutting Machine 12" to 36" length capacity (New)
PRATT & WHITNEY: Gear Grinder, 10" single and double wheel, hydraulic feed
GEAR GRIND MACH: GG-19, 10"x24" Hydr. Spur Gears and Splines
INTERNAL GEAR GRINDER, GG-31

GEAR TESTERS
FELLOWS: 8 LSI and 13 LSI Gear Lappers, external and internal spur and helical
FELLOWS: #12C Cone & Spacing Inspection Instrument
GLEASON: No. 3 Bevel Gear Tester
GLEASON No. 4 and No. 6 Bevel Gear Testers. Hand and Power
NATIONAL BROACH: SIC-12" Red Ring Gear Testing Machine

GRINDERS—CYLINDRICAL
BROWN & SHARPE: No. 10 capacity 6"x18" plain
CINCINNATI, 6"x18" Hydraulic, Plain

GRINDERS CYL.—*continued*
LANDIS: 16x32" Type "D" Crankpin, hydraulic, for grinding crankshafts
NORTON: 10"x18" 45° angle wheel

GRINDERS—GEAR & SPLINE
GEAR GRIND MACH.: GG-19, 10"x24" Hydr. Spur Gears and Splines
PRATT & WHITNEY: 10" single and double wheel, hydraulic feed
INTERNAL GEAR GRINDER, GG-31

GRINDERS—INTERNAL
BRYANT: 16-16 Internal Hydraulic
BRYANT: No. 5Y Internal
HEALD: 72A3 Sizematic Centerless
HEALD: #73 Centerless Internal Grinder

GRINDERS—RADIUS
VAN NORMAN: #73, capacity 7½"
VAN NORMAN: #649-16, cap. 6" to 16" dia.
VAN NORMAN: #3½ Un. Radius

GRINDERS—THREAD
EXCELLO: #31 External, dia. 5"x18"

HONING MACHINES
MICROMATIC: H-510 Double End Horizontal, ¾" to 2" dia.
MICROMATIC: H-2 Single End Horizontal, 2 spindle, ¼" to 1" dia.

LAPPING MACHINES
FELLOWS: 8 LSI and 13 LSI Gear Lappers, external and internal spur and helical

LATHES—PRODUCTION
BLOUNT: Polishing speed lathe 12" dia. x 48" centers
LODGE & SHIPLEY: #3A Duomatic, 25½" swing x 27" centers

LATHES—TURRET
WARNER & SWASEY: 1A & 3A
WARNER & SWASEY #3 & #5
HERBERT: #0, #2, #4, #7, #8 and #9B/30 Sizes, new
WEBSTER & BENNETT: Vertical Turret Lathes 36" & 48" (New)

MILLING MACHINES
TAYLOR-FENN: M-80 Duplex Spline
RICE-BARTON: 4" Twin Spline
VAN NORMAN: 10CT Contour Miller, horizontal opposed spindle type for milling flat cams, also can be converted to similar work

SAWS & CUT-OFF MACHINES
RUSSELL: 9½" cut-off Saw with Auto. Stock Feed (New) Hydraulic
RUSSELL: 5½" dia. cut-off saws, auto stock feed, hydraulic (New)
MOTCH & MERRYWEATHER: No. 3 Circular Saw with auto. stock feed

THREAD MILLERS & TAPPERS
HALL PLANETARY: Model "D" Thread Miller
LANDIS: 2½" single head horiz. threading machine
LEES-BRADNER: #40A Thread Miller
LEES-BRADNER: CT-36 Thread Miller chucking type, 13⅛" hole
MURCHEY: #22 Horizontal threading and tapping machine, ⅓" to ½" dia. capacity, single spindle

MISCELLANEOUS
OPTICAL PROFILE GRINDER: Wickman New
OPTICAL PROFILE GRINDER, Sheffield, used
AUTOMATIC SCREW MACHINE, Swiss type, ⅝"—used
AUTOMATIC SCREW MACHINE, Wickman, Single Spindle, 7/16" New
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Monarch 16x54" C.C., 3 jaw chuck reliev'g attach't, 1944 RCG

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Cincinnati #4 High Power, with motors, 1942 RCG

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No. 4 Milwaukee D.O.A. Plain, a.c. m.i.b., p.r.t., Timken, #50 taper

No. 4 Cincinnati High Power Universal, a.c. m.d., div. hds.

No. 4-B Brown & Sharpe Heavy Plain, a.c. m.d., all geared

No. 3-B Brown & Sharpe Heavy Plain, a.c. m.d., all geared

No. 3 Cincinnati Dial Type Medium Speed Plain, a.c. m.i.b., p.r.t., Timken, #50 taper

No. 3 Cincinnati Dial Type Medium Speed Vertical, a.c. m.i.b., p.r.t., Timken, #50 taper

No. 2-MH Cincinnati Rect. overarm Plain, a.c. m.i.b., Timken, #50 taper, speed range to 1200 r.p.m., new 1940

No. 36 Van Norman Ram Type, a.c. m.d., Timken, #50 taper, div. hds., new 1943

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68"x21' ctrs Niles-Bement-Pond Heavy Duty Grd. Hd., actual swing 68", screw cutting, 4-speed a.c. m.d., taper attachment

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36"x120" ctrs American 12-speed Grd. Hd., a.c. m.d., taper attachment

36"x96" ctrs Schumacher & Boye Triple Geared, cone drive, taper attachment

22"x74" ctrs Lodge & Shipley 12-speed Selec. Grd. Hd., a.c. m.d., taper attachment

20"x72" ctrs Lodge & Shipley 12-speed Selec. Grd. Hd., a.c. m.d.

19"x54" ctrs LeBlond "Regal" Grd. Hd., a.c. m.d., Timken, new 1940

19"x48" ctrs LeBlond Heavy Duty Grd. Hd., 12-speed, a.c. m.d., taper attachment

TURRET LATHES

No. 4-A Warner & Swasey Saddle Type, a.c. m.d., 8" spindle, covered ways, p.r.t., bar feed

No. 3H8 Libby-International Heavy Duty Saddle Type, a.c. m.d., 8" spindle, Timken, quick change gearbox, p.r.t., hard ways, new 1942

No. 3 Acme Full Universal, a.c. m.d., 4¾" spindle, hard ways

No. 3-A Warner & Swasey Saddle Type, a.c. m.d., 4¾ spindle, Timken, covered ways, taper attachment, screw chasing attachment, p.r.t. tooling

No. 2-L Gisholt High Production Saddle Type, 25 h.p. two-speed m.d., 4-1/16" spindle, Timken, hardened ways, p.r.t.

MISCELLANEOUS

3'-9" col. American High Speed Radial Drill, top speed 1500 r.p.m., fully enclosed head, very clean

50-ton WARCO O.B.I. Press, a.c. m.d., air clutch, new 1946

No. 4 Fosdick 4-spindle High Speed Ball Bearing Sensitive Drill, a.c. m.d., new 1941

A-1-8 Arter Rotary Surface Grinder, a.c. m.d., 8½" chuck, new 1943

24" Bullard "New Era" Vertical Turret Lathe, a.c. m.d., side head, p.r.t., threading attachment

Model B Long & Allstatter Double Angle Shear, arr. m.d., capt. 6"x6"x1"

Model G Cleveland Punch & Shear, a.c. m.d., 60" throat, capt. 2" thru 1"

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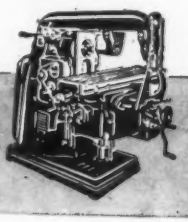

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Late Type, 36" x 92" table size, 12 spindle speeds (12-720 RPM) Serial No. 41M-345-385-4, New 1943.
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Capacity (Max) round 1⅝", Complete, new 1944.
Standard Motors, Serial No. 29640.
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DRILL PRESS: NATCO 24 Multiple-Spindle, Model DEBL, Rectangular Head, new 1944.
LATHES, GEARED HEAD: Swing from 36" to 50", Centers from 12' to 20'.
MILLING MACHINE: CINCINNATI 3-36, Production, Tracer Controls.
PRESS BRAKE: STEELWELD, 12' 3/16", new 1946.
PUNCH PRESS: BLISS 1000 ton, Model 80½, Straight Side, 48"x80".
SURFACE GRINDER: NORTON Hydraulic, 10"x36", new 1942.

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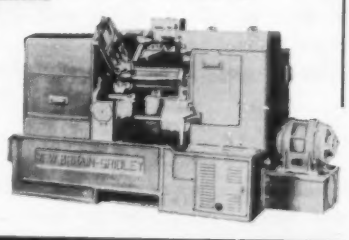
SINCE 1934, SERVING THE METAL WORKING INDUSTRY



MANDEL CAMRAS

MOnroe 6-2177
MACHINERY COMPANY
1324 W. Randolph St. Chicago 7, Ill.

10' Betts Vert. Boring Mill 2 heads

3⅛" Fosdick Horiz. Boring Mill

#4 Cincinnati plain Miller, Lima drive table 76" x 16"

#2 Cincinnati HP plain Miller geared head table 42" x 12"

36" x 36" x 14' Cincinnati Planer belted motor 3 heads

CLARENCE J. O'BRIEN
1032 COMMERCIAL TRUST
PHILADELPHIA 2, PA.

BENNETT MACHINERY CO.

GUARANTEED MACHINE TOOLS

BORING MILLS, 42" King, Side Hd., New 1942
72" King, P.R.T., M.D.
100" & 72" N.B.P., 2 hds., M.D.
4" bar Sellers Tble., 96" to outer support
3¾" bar Defiance, Table (2)
BRAKE, 10'x3/16" D. & K. No. 4510D, Press
RADIAL DRILL, 5'15" col. Amer., Motor-on-Arm
GRINDER CYL., 18"x144" Norton, M.D.
GRINDER, 16"x96" Landis Hyd., Late
LATHES, 48"x29' & 24' beds Niles (2)
36"x32' con. Putnam Grd. Hd.
24"x12' bed B. & E., T.A.
18"x12' bed L. & S., T.A., M.D.
14"x60" con. Amer., T.A.
SHAPERS, 32", 28", 20", 16" & 14", G. & E.
SLOTTER, 36" Rockford Hydraulic, 1942

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1222

HIGH PRODUCTION
and
SPECIAL MACHINE TOOLS

PRODUCTION & EQUIPMENT CO.
1534 Trumbull Detroit 16, Mich.

MODERNIZE for Greater Profits with WIGGLESWORTH MACHINE TOOLS

AUTOMATICS

1⅝" 8 spdle. Cone, late, mag. feed
⅞" 4 spdle. Cone, drill att.
#60 New Britain, threading, 1942
1¾" Model G Gridley, 4 spdle.
2⅝" Cone 4 spdle., well equipped, 1936
¾" Model F Gridley, 4 spdle.

BORING MILLS

8' Betts Cons., 130" thru gap, late
No. 48A Heald sgle. end, borematic
#25T G & L horiz., 1947, std. equip.
3½" Cinn. Gilbert floor type, late
24" Bullard New Era, rail & side head
36" Bullard New Era, rail & side head
42" Bullard New Era, rail & side head

GRINDERS

#52 Heald, borematic type, 24 x 66" tble.
#14 Gardner opposed disc, 18" wheels
#72A Heald gagematic, internal
#2 Cinn. Centerless, plain, hopper feed
#2 Oliver arc face mill, late
#2 Cinn. Centerless, Filmatic, thru feed
10x36" Norton type C, mech. infeed, late
#444 Van Norman rotary surface, 22" dia.
#76RA Rogers knife grinder, 76", late
#4 Bryant Internal, auto. sizing
14x36" Norton C semi-auto., cyl.
73 Heald Internal Centerless
P & W deep hole drill grinder, late
Model 1311 P & W contour, late

DRILLS

42" Cinn. sliding head, s.p.d.
4'11" Canedy-Otto radial, 1¾" cap., late
Type 41 Natco, 12 spdle, #4 M.T., inline head
#12 P & W, 9 spdle, #2 M.T., power feed
D-4 Colburn, #5 M.T., 3½" cap., 24" swing
Baker Hvy Dty, #5 M.T., p.f.
#2LMS Leland-Gifford, 26", hydraulic
#2 Allen, 2, 4, 6 spdle., #2 M.T.

GEAR MACHINERY

15" Gleason quench press, late
60BM G & E cutter, 3 spdle., late
7A Fellows, shaper high speed, hvy duty
61A Fellows, shaper, high speed precision

LATHES

Model 9WSL Reid small piece, late
Connel Dengler spinning, 20" swing, 15 HP
14x36" Carroll-Jamieson, g.h., chucks, 1942
18"x46" Monarch 8 speed g.h., taper
42"x26' ctrs American, High Duty, 16 speeds
30"x10' American geared head, taper att.
48"x35' LeBlond Hvy Dty, taper, late
Gisholt Simplimatic, platen type, late

TURRET LATHES

#3 J & L Univ. bar feed, 2" hole, late
#5 B & O Univ., chuck, pre-selector, late
#1A W & S Univ., 3" hole, #417,756
#1L Gisholt Universal, 3" hole, 1937
Libby type H, 24" swing, 8 spdle, speeds
#2 Simmons Microspeed, air chuck, late
#3 Gisholt Universal, late
#4 W & S, bar feed, serial #342461
#4A W&S Univ., cross sliding turret, 1944

SHAPERS & PLANERS

48x48x14' Detrick & Harvey dble. hsg.
48x48x16' Liberty openside, p.f.
26" Smith & Mills shaper, 4 step cone

MILLS

#3 B & S vert., s.p.d.
08 Cinn. horiz., rise & fall, 1943
08 Cinn. horiz., auto. cycle, 1943
#1½B K & T horiz., dble. overarm, rebuilt
10C Van Norman Contour
#3 Cinn. high speed dial type, vertical
#5 B & S horiz., round overarm, 16 speeds

TAPPERS

Cleve. Model DB, 1¼" cap., lead screw
Cleve. Model EO, ½" cap., lead screw
No. 2CAM Haskins, 5/16" cap., late
#10 W & S precision, 8-32 threads, late

THREADERS

Lees Bradner Model B Cridan miller, late
8x16' Hanson-Whitney Universal, mill, late
6x80" P & W miller, splining & milling
#50 Excello Precision grinder, 28x68"
13" Automatic Machinery miller, late
LT636 Lees Bradner mill, 18x36", late
1½" Landis, 2 spdle., lead screw type
#31 Excello, diamond dresser, late

PRESSES

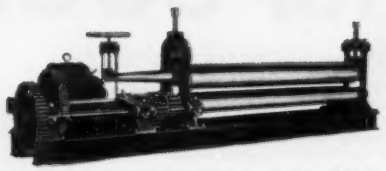
750 ton HPM triple action, 120 x 60" bed
40 ton Lemco arbor, motor driven, late
#37 Excelsior dble. crank, 45 ton
250 ton Elmes hyd. shell nosing, 21½" str.
Ferracute type EG-52 embossing, 150 ton

WELDERS

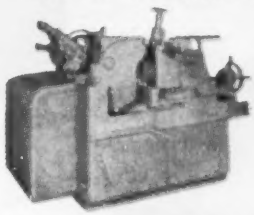
75KVA Thompson-Gibbs press type proj. spot
"Una" 400 amp. submerged arc, 2500# pos.
250 KVA Federal air oper. spot, 42" throat
400 amp P & H arc, motor generator type
400 amp Hobart arc, motor generator type
400 amp A. O. Smith arc, transformer type

MISCELLANEOUS

HONE: #172 Barnes, 7" stroke, 2" dia., late
CHIP WRINGER: Barrett, 1 bushel
BROACH: American H20-60, 20 ton
SLITTER: Stamco 50" x 10 gauge, gang
BENDING ROLL: #349 Niagara, 24" wide
BENDING ROLL: 20' x 1" Wickes
MAGNAFLUX: MA-3 production type, 3000 amp.
TUBE BENDER: R-48 W & W hyd., 1¼", late
BULLDOZERS: #2 Ajax High Speed, 30 ton
SAW: 34" Espen-Lucas, 1945

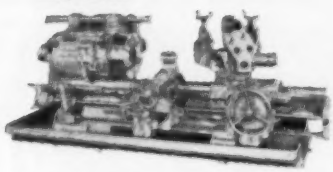


20'x1" Wickes Pyramid Type Bending Rolls, 20" upper roll, 14" lower, power adj.

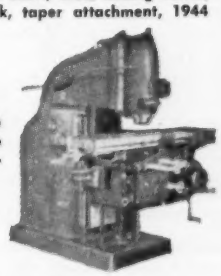


No. 2 Cinn. Centerless, thru feed, Filmatic

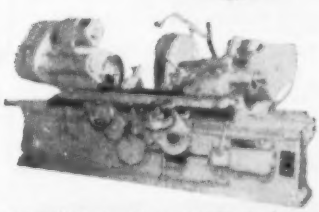
No. 50 Excello thread grinder, 50" thread, 28" swing x 68" centers, late, rebuilt



No. 4A W & S Univ., cross sliding turret, 24" air chuck, taper attachment, 1944



No. 3 Cinn. High Speed Dial Type vertical, 1953, rebuilt



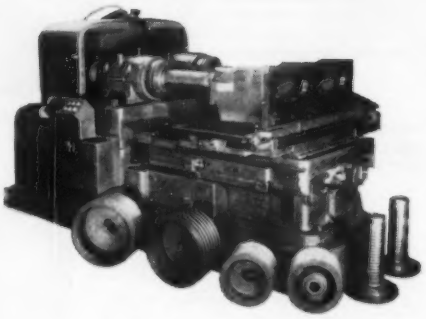
14x36" Norton Type C 1943 Mech. Infeed, 30x12x6" Wheel H.D.

T. R. WIGGLESWORTH MACHINERY COMPANY
1719 SUPERIOR AVENUE • • • SUPERIOR 1-8727 • • • CLEVELAND 14, OHIO

LOOK to WIGGLESWORTH for GOOD Machine Tools

LATE MODEL TOOLS IN STOCK

3'11" DRESES Radial Drill, motor on arm drive
E-5 NATCO Adjustable Head, Multiple Spindle Drilling Machine
No. 5A BRYANT Internal Grinder
No. 172 HEALD Gap Internal Grinder
6"x18" NORTON Vert. Spindle Surface Grinder
24" x 276" LANDIS Type B Heavy Duty Roll Grinding Machine, M.D.
No. 4H LANDIS, 4"x18" Plain Grinder
10"x72" LANDIS Type C Hydr. Plain Grinder
12"x17"x40" THOMPSON Type B Hyd. Surface Grinder, New 1952
12"x30" MONARCH Model "C" Toolroom Lathes
No. 608 RIVETT Precision Toolmakers' Lathes
No. 2 ACME Universal Turret Lathe, Long Bed
No. 1L GISHOLT Saddle Type Univ. Turret Lathe, 1952
No. 8A JONES & LAMSON Saddle Type Tur. Lathe
Nos. 4D & 6S POTTER & JOHNSTON Automatic Lathes



No. 45 HEALD Single End Precision Boring Machine, with Two Heads, M.D. with cross sliding table, new in 1946. Ex. Cond.

No. 2 CINCINNATI Plain High Speed Dial Type Plain Millers
No. 1-18 CINCINNATI Plain Mfg. Miller
No. 12 BROWN & SHARPE Production Miller
No. 08 CINCINNATI Plain Production Millers
No. 1-8 KENT OWENS Production Miller
M-54 TAYLOR & FENN Duplex Spline Miller
No. 2M CINCINNATI Vert. Miller
12"x24" LEES BRADNER Model HT Thread Miller, M.D.
6"x60" P&W Model C Thread Miller
No. 12 FELLOWS Gear Shaver
No. 36 BM GOULD & EBERHARDT Gear Rougher
100" BETTS Vertical Boring Mill, 2 heads, M.D.
36" OHIO "Dreadnaught", Hvy. Duty Shaper, M.D.
38" MORTON Draw Cut Shapers, 1945
16/20" GOULD & EBERHARDT Industrial Shaper, 1942
No. 64 FELLOWS Gear Shaper, M.D.
42"x25' centers AMERICAN Geared Head Lathe

WIGGLESWORTH INDUSTRIAL CORP.

203 BENT ST. **CAMBRIDGE, MASS.**

LATE TYPE MACHINE TOOLS

No. 41 Lucas Horizontal Boring Mill. 1941.
HP-100 LaPointe Horizontal Hydraulic Broach. 1945.
No. 7 Gleason "Revex" Gear Rougher. 1943.
16"x72" Norton Univ. 1942.
No. 35 Excello Precision Thread Grinder.
No. 2 Cincinnati Centerless Grinder. 1944.
24-36-Bryant Hydraulic Internal Grinder. 1942.
No. 72A3 Heald Plain Hydraulic Internal Grinder. 1941.
No. 24 Mattison (Hanchett Type) Duplex Grinder.
No. 16A Blanchard Automatic Surface Grinder. 1942.
No. 6DRE Potter & Johnston Automatic. Late.
1" RA-6 Nat. Acme Automatic 1941.
No. H5 Libby Universal Saddle Type Turret Lathe. 1939.
No. 3R Gisholt Universal Saddle Type Turret Lathe. 1942.
No. M-18 Kearney & Trecker Simplex Mill. 1943.
650 Ton Verson Double Action Eccentric Press. 1940.

Ask for Current Stock List

Indianapolis
MACHINERY & SUPPLY CO.
1961 SOUTH MERIDIAN STREET
INDIANAPOLIS 6, INDIANA

VICTOR FOR VALUES

MILLING MACHINES
CINCINNATI, 34-36 Hydromatic Duplex, Tracer Controls both spindles, Excellent. New 1941.
GORTON, 9-J Vert. Spdl. P.F., 1942
KEARNEY & TRECKER 2H, Univ., D.H., 1942
KEARNEY & TRECKER, 2H, 1942
KEARNEY & TRECKER, 1H—18, mfg. new 1943
DEFIANCE, Duplex Hyd., 18"x48" table, timk.

GRINDERS
GALLMEYER & LIVINGSTON #4 Universal Tool & Cutter New 1944
RIVETT #104 Internal & External New 1944
LANDIS 16"x42", Hydraulic Crankshaft.
MATTISON, 14"x16"x48", surface, chuck, 1944
EXCELLO 33-L, precision thread, new, 1943

SHEARS, BRAKES & PRESSES
TRINLER, 64"x1/4", Allsteel Hydraulic, New 1945
NIAGARA, 60"x1/4", Gauges, Holddown, M.D.
NIAGARA, 36"x10 Ga., 15" gap, M.D.
New #1½ IRONWORKER, Notcher & Coper. In stock. Immediate Delivery.
CLEARING, 215 ton, S.S., 10" STR., new 1941

TURRET LATHES
BARDONS & OLIVER, #7, bar & chuck
GISHOLT, No. 4, Preselector, Bar Feed, 1942
GISHOLT, 2L, cross sliding turret, tooling, M.D.

DRILL PRESSES
BAUSH W7 Hydraulic New 1945
FOSDICK 3 & 5 ft. Radial Drills
BARNES, No. 282 two-spindle, 1943.
LELAND-GIFFORD, 4 SP., #2 LMS, M.D., Late

Serving Metalworking Since 1933

Victor MACHINERY COMPANY
CEntral 6-3139
137 S. Clinton St., Chicago 6, Ill.

USED HOBBING PRESSES
REASONABLY PRICED

Capacity 3000 Tons — Platen Area 40"—Movable Top Head, Adjustable from 24" min. to 48" max.—Approx $5000 worth of Tooling.

• • •

Capacity 1000 Tons (Illustrated)—Self Contained—Complete with Safety Guard and maximum Pressure Regulator.

M & N HYDRAULIC PRESS CO.
780 ROUTE 3
CLIFTON, N. J.

CHAMBERSBURG CECO STAMP

Practically New
30" x 24" Bed Area
Special Offering—$3,500.00

WINSTON MACHINERY COMPANY, INC.
326 West Ohio St., Indianapolis 2, Indiana

AUTOMATICS
Acme Gridley R6—1¾" 9/16" Model G Gridley
Acme Gridley RA6—9/16"

MISC.
Barber Colman No. 12 Conveyor Type Washer
Gould & Eberhardt—18H National Bent Tap Tapper

BRADLEY MACHINERY CO.
211 Jos. Campau Detroit, Michigan

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STEEL SHEAR

One ¼" x 10' Dries & Krump All Steel Shear complete with electrical equipment. First class condition. $5000.00.

BOWERS & WOOD MFG. COMPANY
WEST MEMPHIS, ARKANSAS

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ATTENTION EXPORTERS

Unusual opportunity to procure modern Fellows Gear Shapers 615A and 645 as well as 12" Gleason Generators, 36 BM Gould & Eberhardt Rougher, #7 Fellows Gear Shaper, #16 D. E. Whiton Machine. Write for full information.

FS-1003, AMERICAN MACHINIST
330 W. 42 St., New York 36, N. Y.

EMERMAN OFFERS FROM STOCK FOR SALE OR RENT

LATE TYPE MACHINERY IN EXCELLENT CONDITION

ENGINE LATHES

14"x30" Hendey, taper att. 1942
16"x54" Lodge & Shipley, Taper Att. Tool Room Lathe, Relieving att. 1947
18"x48" Monarch—1946
20"x48" American—1940
20"x91" Axelson S.S. Lathe
20"x96" Sidney—1932
20"x96" Lodge & Shipley, taper att. 1941
20"x60" Reed Prentice, Geared Hd. 1925
24"x12' Monarch, Timken Bearing—1933
25"x96" Monarch, 1942, well tooled
24"x168" Monarch, Rapid Tra. 1942
36"x18' LeBlond, Geared Hd.
36"x18' Lodge & Shipley, Geared Hd.
54"x18' Houston, Stanwood & Gamble, 1920

TURRET LATHES

2—No. 3 Gisholt Univ. Ram Type Chucking, 1944
No. 4 Gisholt—1944
No. 4 Warner & Swasey Univ. Bar & Chuck
No. 5 Warner & Swasey—1942
3—No. 5 Gisholt, Pre-selector—1943
No. 1L Gisholt, Bar and Chuck—1932-42
No. 3L Gisholt, Bar & Chuck—well tooled—1942
No. 1A Warner & Swasey, Pre-selector, & Chuck well tooled, 1945
No. 2A Warner & Swasey, Pre-Selector, & Chuck well tooled, 1943
No. 2H8" Libby—8¼" hole in spindle

PRODUCTION LATHES

8"x108" Lo Swing—1947
15"x30" Lipe Carbo-matic—1942
20"x25" Fay—1948
No. 8 Sundstrand, front and rear cross slides & tailstock—1940
No. 16AL LeBlond—1940

VERTICAL BORING MILLS

24" Bullard—1926
42" Bullard—1928
54" Bullard—1930
62" Bullard—1933

MILLING MACHINES, PLAIN HORIZ.

No. 2H Kearney & Trecker—1943
No. 3H Kearney & Trecker—1943—w/Vert. Head
2—No. 3K Kearney & Trecker—1943
No. 3 Cinn. High Speed Dial Type—1943
No. 4K Kearney & Trecker—vert. head, tooling—1943
5H Kearney & Trecker Plain Horiz.

MILLING MACHINES, PRODUCTION

No. 1248 Kearney & Trecker—1942
No. 1854 Kearney & Trecker Simplex Prod. —1943
No. 4-48 Cinn. Hydromatic Mill, 1940
No. 1402 Kearney & Trecker—1932
No. 1403 Kearney & Trecker Timken—1932
No. 2204 Kearney & Trecker Simplex Prod. —1932
36-72 Cinn. Horiz. Hydrotel—1942
56-72 Cinn. Hydromatic Duplex — 1942 widen pattern

MILLING MACHINES, UNIVERSAL

No. 2K Kearney & Trecker, Vert. Hd. dividing hd. tailstock, rotary table, misc. tooling and elec. 1943
No. 4AFU Universal Mill, dividing hd. tailstock, arbors, & Elec. NEW

MILLING MACHINES, VERT.

No. 3 Cinn. Vert. Dial Type, 1942
No. 4H Kearney & Trecker Vert. 1941
No. 3V Van Norman Vert. 1942
No. 4 Cincinnati Vert. Dial Type—1941

GRINDERS, CYLINDRICAL

6"x18" Norton Plain—1940
6"x30" Landis Type C Hyd. 1941
10"x36" Norton Type C Plain—1942
10"x48" Norton Type CD Plain Hyd. Plunge Cut—1942
14"x48" Cinn. Plain
10"x50" Norton, Older

GRINDERS, INTERNAL

No. 72A3 Heald Extended Bed, Int. 1943
No. 24-26 Bryant Int.
No. 75A Heald—1942

GRINDERS, SURFACE

6"x18" Thompson Horiz. Sur. Type F 1942
8"x24" 3B Abrasive Sur. 1943
84" Lumsden Vert. Rotary Sur. 1940

GEAR HOBBERS

Type A Barber Colman 84" extended Bed —1937
8H Gould & Eberhardt
16H Gould & Eberhardt

GEAR SHAPERS

No. 6" Fellows Gear Shaper—1943
No. 61A Fellows Gear Shaper—1943
No. 645A3 Fellows 1943
No. 7125A Fellows 1953
No. 725A Fellows 1943
(4) Pratt & Whitney 12" Vert. Shapers

PRESSES

No. 426½ Hamilton Dbl. Crank—150 ton cap., 10" stroke, 42"x38" bed
No. 665 Toledo Knuckle Joint—1934
300-Ton HPM Fastraverse Hyd.

DRILLS

3'11" Carlton Radial—1941
4'11" Cincinnati-Gilbert—1942
4'11" Carlton Radial—1951
4'15" Carlton Radial—1941
5'11" Carlton Radial—1941
5'15" Carlton Radial, DC motor drive on arm, 1930
H4 Barnes Hydram Hyd. in and out table—1944
No. 36HO Baker Hyd. in and out feed table—1944
No. 242 Barnes Q.C.G.—1927
4B12 Edlund 4-Spindle Drill—1940
4' Hammond Drill & Tapper—1943

MISCELLANEOUS

2-5¾" Cleveland Single Spindle Auto. Screw Mach. with vert. slide, bar feed, 1941
24" Rockford Hyd. Shaper—1943
12" 6-Spdl. Bullard Type D Multimatic—1943—Power Chucking
No. 47A Heald Borematic with 2 Heald Red Heads—1942
2—100,000 lb. Tinius Olson Testing Machine
Ingersoll 5-Spdl. Rotary Drum Type Mill
#2 Cinn. Centerless Grinder, 1942
#3 Cinn. Centerless Grinder, 1942
2—B4B Natco Multiple Drills, Rectangular heads, 1944

MODEL B4B NATCO HOLESTEEL HYDRAULIC MULTIPLE SPINDLE DRILLING MACHINE

60—1" upper joint slip type spindles
Travel of spindle head 18"
Solenoid stop
Size of rectangular head 44" x 60"
Size of floor base 44" x 60"
Hydraulic system mounted in base
Self-contained V-belt motor drive with AC motor 3/60/220-440
Push button control and cluster plate

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HERE IS A *PARTIAL* LIST OF MACHINERY IN OUR WAREHOUSE

15x3' LeBLOND Regal Lathe 1941
16x102" REED PRENTICE Lathe 1941
No. 1A WARNER & SWASEY Turret Lathe, 1943, BF & CH
2A W&S Pre. Turret Lathe Chucker, 1942
4A WARNER & SWASEY 12" Hole Cross Sl. Turret Lead Screw, Power Chuck, 1941
No. 47A HEALD Boring Mill, Late, 2 Spdl. S.E.
4" UNIVERSAL Boring Mill, Horiz. Table 42 x 72, New 1944
8½D, 9J GORTON Mills, 1951
No. 2 CINCINNATI Mill, Vert. HSDT, 1943
No. 2 CINCINNATI GRINDER, Contour Cutter, 1946
16A BLANCHARD Grinder, 1944
No. 226 GARDNER Grinder, Disc, 1948, Excel.
6x18 Cyl. LANDIS Grinder, Plunge Cut, 1943
BARBER COLMAN HRS Hob Sharpener Mod. Z FELLOWS Shaper, 1943
1⅞" CONE Screw Machine, 8 Spdl., 1942
7½" GOSS & DE LEEUW Screw Machine, 6 Spdl. Aut. Chucker; Work Rotating, 1943

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Follow the LEAD of SATISFIED USERS...

Select BEHR Machinery and have it rebuilt to like-new tolerances

Yes... follow the lead of these men who say "rebuild to specifications"—they represent 90% of those who buy machine tools from Joseph Behr & Sons' large and complete stock. You can make your selection direct from our WAREHOUSE in Rockford and have it rebuilt right on the spot, as you desire—to new tolerances.

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MACHINE TOOL REBUILDING

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OSWEGO, N. Y. **PHONE 1763**

---

2 NORTON Univ Tool & Cutter Grinder
12x68" PRATT & WHITNEY Thread Miller
4x60" LoSwing Production Lathe
BROWN & SHARPE Automatics (several)
W.F.F. Double Action Power Presses
#08 CINN. Vert. with Rotary Table
30" ESPEN-LUCAS Hydraulic Cold Saw
#2A WARNER & SWASEY Turret Lathe
#2 B&S Univ. Grinders, C&S, Tooling
HASKINS #2 Cam Tapper, Index Fixture
#4 TORRINGTON 4 Die Swager
Numerous Other Machine Tools

CURRIER MACHINE SALES
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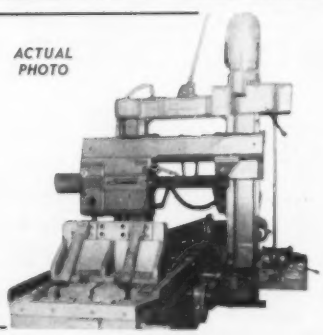
North Haven, Conn.

NEW 1945
INGERSOLL SLAB OR STRADDLE MILL 24" x 24" x 12'

Rise and fall, rapid traverse, complete tracing control, quick change speeds and feeds, tubular ways, anti-friction bearings, all electrical equipment, automatic cycling, coolant system.

MILES MACHINERY COMPANY
2025 Genesee Ave., Saginaw, Mich.

ACTUAL PHOTO



Automatics for sale in good condition, just off the floor and ready for work.

1—5¾" dia. Model "B" Single Spindle Cleveland

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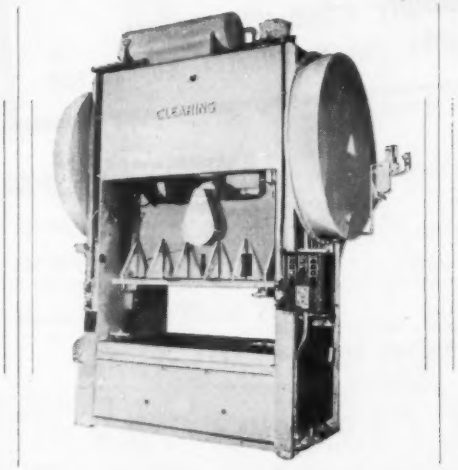

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73½, 74½, 75½, 77½, BLISS
207 BLISS TRIMMING PRESS
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200 Ton CLEVELAND (1942)
5418 HAMILTON—17" CRANK
5B-27 VERSON—ALL STEEL
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DOUBLE CRANK
250 TON CLEARING—Bed 85x44—AIR CLUTCH
2, 3, 4, 5, 7, BLISS
92½, 93, 93½, TOLEDO
94, 95½, 97, TOLEDO
67-D, 610F NIAGARA
201, 202, 203, TOLEDO (GAP)
250 TON CLEARING (GAP) ELECTRONIC AIR CLUTCH (1948) BED 108"x38"

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1½, 3½, 3¾, 4, BLISS Toggle
405-A, 407-A BLISS Toggle
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174-S, 176 TOLEDO Toggle
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HEALD 249 Double End Bore-Matic, 1942. 2 available; one with Hyd., Cross Slide.

DRILLS & TAPPERS
AVEY 6-Spindle No. 2MA6 Power Feed, No. 2 MT, 12" Overhang, 1943.
DEMCO 6 spindle No. 2 MT Hand Feed, 1944
BAUSH No. 47, 16 Adjustable Spindles, Hydraulic Table, Tapping, 1942.
BAKEWELL, No. 1, 1941
NATCO E5 Multiple driller and tapper, 14 adjustable spindles, 1941

GEAR EQUIPMENT
FELLOWS 6IA Gear Shaper, 1941. 2 available.
PRATT & WHITNEY 10" Hydraulic, 2 Wheel Gear Grinders (2), 1941.

GRINDERS, CYLINDRICAL
SCHMALTZ 30"x48" Hydraulic, 1939.
NORTON 10"x18" Type C Hydraulic, 1942.
BROWN & SHARPE No. 5 3"x12" Plain with Plunge Grinding, 1941.

GRINDERS, INTERNAL
HEALD No. 70A3, 1940.
HEALD No. 72A3 Gagematic; 2 available, 1940.
HEALD, No. 81 Sizematic, 1944.

LATHES, AUTOMATIC & PRODUCTION
GISHOLT No. 12 Automatic Hydraulic, Direct Spindle Drive, new 1946.
LODGE & SHIPLEY 3A Duomatic, 1945.
SENECA FALLS Model R-14 Le-Swing, 1942.
SENECA FALLS Model LR Le-Swing, complete, 1942.

LATHES, ENGINE
LEBLOND 13"x18" Regal, T.A. Chucks Tooling, 1942.
NILES 30"x144" centers, Timesaver T.A. Chuck, 1941.

LATHES, TURRET
GISHOLT No. 3 ram type universal bar and chuck, 1942.

MILLS
KNIGHT No. 40 Vertical, with Jig Boring Equipment; 1942.
CINCINNATI 34-36 Plain hydromatic variable feed attach., 1936.
CINCINNATI 36-90 Plain Hydromatic.
KEARNEY & TRECKER Model 1H—18" Manufacturing Mill, 1941.

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Universal Hob and Worm Measuring Machine. Maximum Diameter 15" with 30" between centers. Must be in good condition. State Manufacturers name and serial number.

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60" Fellows Rack Cutting Machine or comparable make, with 8 pitch and finer.

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Not less than 6 x 36 capacity. Must have automatic indexing and large wheel tracing device. Must be in good condition. State make and serial number.
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HEALD ROTARY SURFACE GRINDER
With 16" chuck or over. Motorized, complete with electrical equipment. Give age, full details of machine, also price.
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2—⅝" 8-spdle Acme Gridley, 1952
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18" Fellows Gear Shaver, 1941
72A3 & 72A5 Heald Int. Grinders, 1942
000 B&S Prod. Mill, 1941
Barnes Hyd. Units, Horiz.
6x18 Norton Vert. Surf. Grinder, 1941
#2 Cincinnati Centerless, 1941
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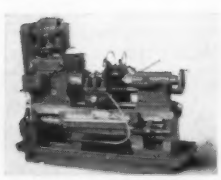

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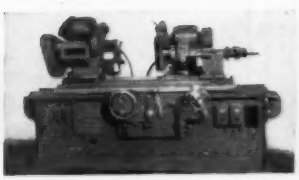

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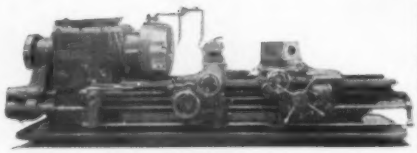

- **GISHOLT** No. 5L Saddle Type Universal Turret Lathe, with chuck, full length lead screw threading attachment and selective gear box, hardened ways, Timken bearing, 30 HP 2-speed motor, 10½" hole. Latest type.
- **WARNER & SWASEY** No. 2A Saddle Type, chucker, with tools. Serial 540786—1941.
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- **JONES & LAMSON** No. 4 Ram Type, bar feed, with tooling. Built 1942. (2 available)
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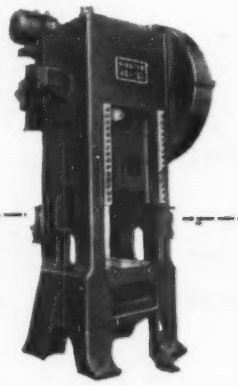

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12—8 Spindle, 12" Power Chuck Capacity complete with motors and controls—S/N 16878, 18113, 23052, 23283, 23458, 19478, 23010, 22161, 22833, 23096, 20989, 20096 all in excellent condition and available at once

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BLISS Nos. 1½, 1½B, 3½A, 3½B, 3½C, 3¾, 5S, 5-40
GARRISON, 500 Ton 12" shaft, 48x64 bed, single crank

INCLINABLE (O.B.I.)

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FERRACUTE C2, C3, C4, C5
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FERRACUTE DGG-56-26" stroke Deep Draw Press
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BLISS No. 88, 255 Ton Capacity, 18" Stroke.

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NIAGARA No. 68C, Bed 48" x 30" with Air Cushion & Air Clutch
NIAGARA No. 69BX, 125 ton, bed 42" x 36", stroke 4", M.D.
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CLEVELAND 65G72 Gap Frame, Bed 96" x 24", 150 ton Motor Driven
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TOLEDO 91-42 Bed 28" x 42" RL, 12" Stroke
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CLEVELAND 45-D-60, 60" x 40" Bed, 3½" stroke

GAP FRAME AND DEEP THROAT

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ADRIANCE 16 Die Crown Cap Press
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NATIONAL 8 Spindle 1" Tapper, M.D.

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AMERICAN 36"—H 9 Ton Broach, 1943
CHAMBERSBURGH 2500 lb. & B&S 1200 Board Drop Hammers
STANDARD Automatic Drop Hammers 1, 2, 3, 4 & 5
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WOODWARD & POWELL 42" x 42" x 36' M.D.
NILES-BEMENT-POND 60 x 60 x 24' M.D.

INGERSOLL PLANER TYPE MILL, 4 HEADS & SLABBING SPINDLE 36" x 24" x 20"

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ULTRA LAP No. 7 A.C. M.D.

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CINCINNATI 6" x 18" Plain Cylindrical Filmatic
HEALD No. 22—12" Rotary Surface Grinders
HEALD No. 81 Centerless Internal Sizematic
NORTON 6x10x36" Surface Grinder
LANDIS 20"x120" Cylindrical Grinder
LANDIS 10" x 24" Type C—Universal

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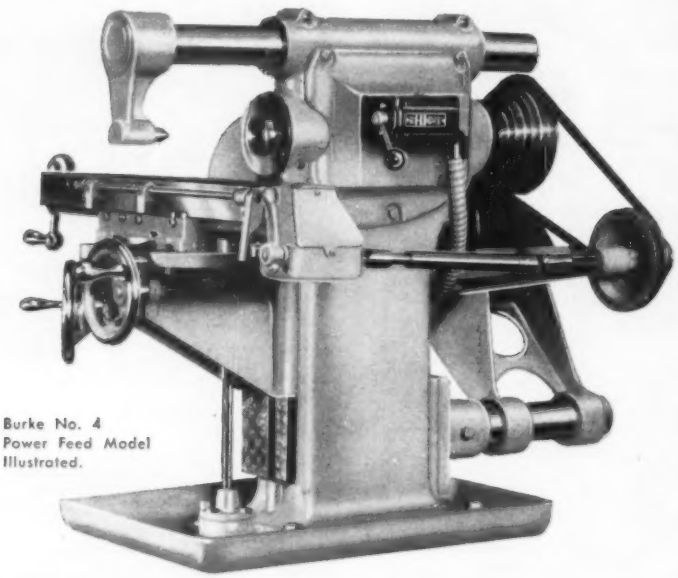

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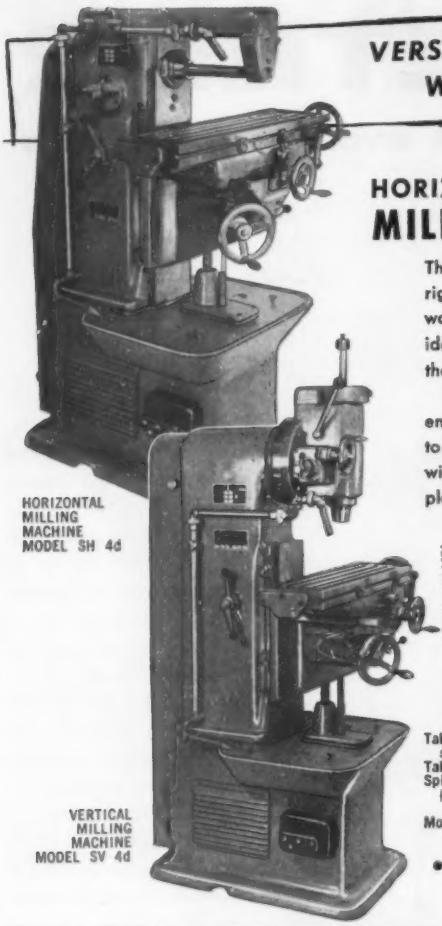

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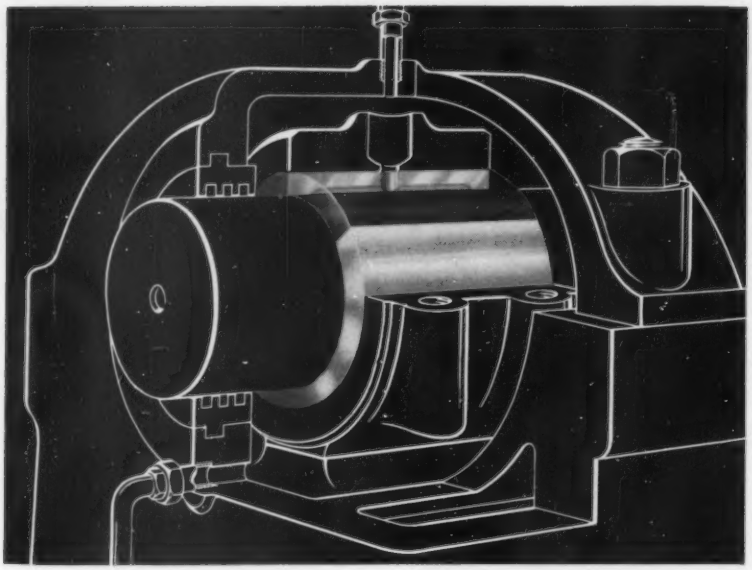

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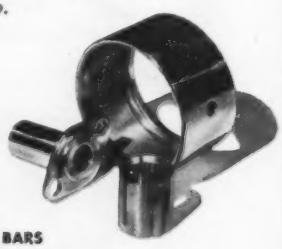

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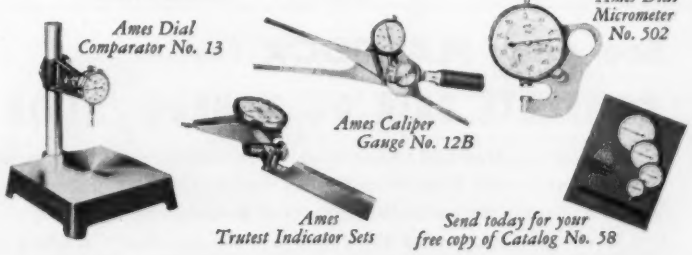

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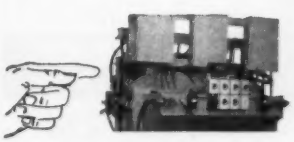
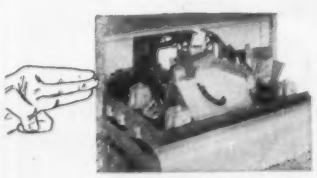
HERE'S A WELDERFULL OF IDEAS

Ideas that speed production — safely —at less cost. Here's resistance welding machine design at its finest. Compact — readily installed — accessible for maintenance — safe and easy to operate — fully automatic. Just a few of the features that make Federal machines first in resistance welding.



All electrical connections readily accessible and compactly arranged in their enclosures for transformer primary leads, electrical accessories terminal board and a "quick disconnect" terminal board for the main control panel. Centralized control station with safety spaced dual start buttons. Emergency cord for instant stopping of machine.

Flash guard moves down to seal off weld area protecting operator and machine. Flexible curtain unrolls with fixture travel to shield slide ways. Body bumper emergency stop. Leg area shield protection.



Booted gun piston rods hardened and ground and equipped with scrapers to avoid weld flash pick-up. Capped electrodes. Guided piston rods for off-set loads. Double acting hydraulic gun cylinders. Air and water hose to fixture kept clear of work area.

Federal WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco PRESSES

THE UNIVERSAL RADIAL CUTTER GRINDING FIXTURE

Does 5 Operations without removing cutter from its ARBOR!

On cutters up to 8" in diameter, the No. 6 fixture, as shown with our No. 6A heavy-duty, right-angle, ballbearing spindle workhead:
Sharpens side teeth on **both** sides.
Sharpens peripheral teeth.
Generates small or large radii on **both** corners of each tooth.
(Other workheads available)

▲ THESE DEPENDABLE GRINDING FIXTURES SAVE THE LIFE OF YOUR CUTTERS. Write for our catalog 602

◀ UNIT 1A
This Universal Cutter Grinding Fixture fits any universal tool or surface grinder.

UNIT 5
Universal Index Workhead for universal tool or surface grinder. ▼

Radial Grinding Attachment D combines with Unit 1A for sharpening end mills with square, conical, or ball nose shapes. ▼

▲ UNIT 4A
Radial Grinding Fixture for sharpening fluted end mills with square, conical, or ball-nose mills. The index disc provides for multi-flute cutters.

ROCHELEAU TOOL & DIE CO.
651 North Main St., Leominster 1, Mass.

Export Office: States Trading Co., 401 Broadway, New York 13, New York. Cable Address: STRADESO, N. Y.

From the *American Machinist* Library of *Tips for Top Shop Men*

BE MAN enough to stand up and fight for what you say and believe—or don't say it. If you're afraid of the boss, making remarks behind his back won't give you confidence.

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HOW IMPORTANT IS

CHATTERLESS COUNTERSINKING To You?

The Severance Chatterless Countersink is Engineered for today's fast production schedules. It will give you what you've always wanted in a countersink—

CHATTERLESS ACTION
SMOOTH SEATS
FAST CUTTING
LONG SERVICE

Take advantage of last minute developments in countersink design—
Save Time and Money!
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Severance CHATTERLESS COUNTERSINK SET No. 27

Set No. 27 contains a ¼", ⅜", ½", and ¾" countersink. These sizes will cover a big majority of your countersinking operations. They'll come to you in a specially designed case which closes flat so as to fit in standard toolbox drawers. Order by Set No. with centerline angle desired, thus: 1 only Set No. 27-41°; 10 only Set No. 27-45°; etc.

SEVERANCE CHATTERLESS COUNTERSINK SET No. 27 including Flat Wooden Case $9.50
*Plus 10% in less than 10 Sets.

TOOL NO	BODY DIA.	SHANK DIA.	*LIST PRICE
BA	3/16	3/16	1.30
CB	1/4	3/16	1.30
DC	5/16	1/4	1.60
EC	3/8	1/4	1.85
GD	1/2	3/8	2.40
IE	5/8	3/8	3.50
JF	3/4	1/2	4.60
KG	7/8	1/2	5.75
LI	1	1/2	7.00
NJ	1 1/4	3/4	10.25
PK	1 1/2	3/4	13.65
RL	1 3/4	1	17.10
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WHEN ORDERING GIVE: TOOL NO. AND CENTER-LINE ANGLE DESIRED.
THUS: 12 ONLY CB-30°; 24 ONLY GD-41°; ETC.
* PLUS 10% IN LESS THAN 10 OF ANY ITEM

Save Time! Save Money
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THE Severance LINE ALSO INCLUDES

ASK FOR A SEVERANCE CATALOG TODAY!

Severance TOOL INDUSTRIES INC.
726 IOWA AVENUE, SAGINAW, MICHIGAN

precision *beyond question*

The requirements exacted of surface grinding machines leave no room for variation. Precision and tolerance control must be built-in. Through the years Grand Rapids Grinders have demonstrated the highest quality and unquestioned dependability of performance. Upon this record they have been accorded world-wide acceptance as standard of the industry. Here is precision beyond question.

GALLMEYER & LIVINGSTON CO., 200 Straight Ave., Grand Rapids, Mich.

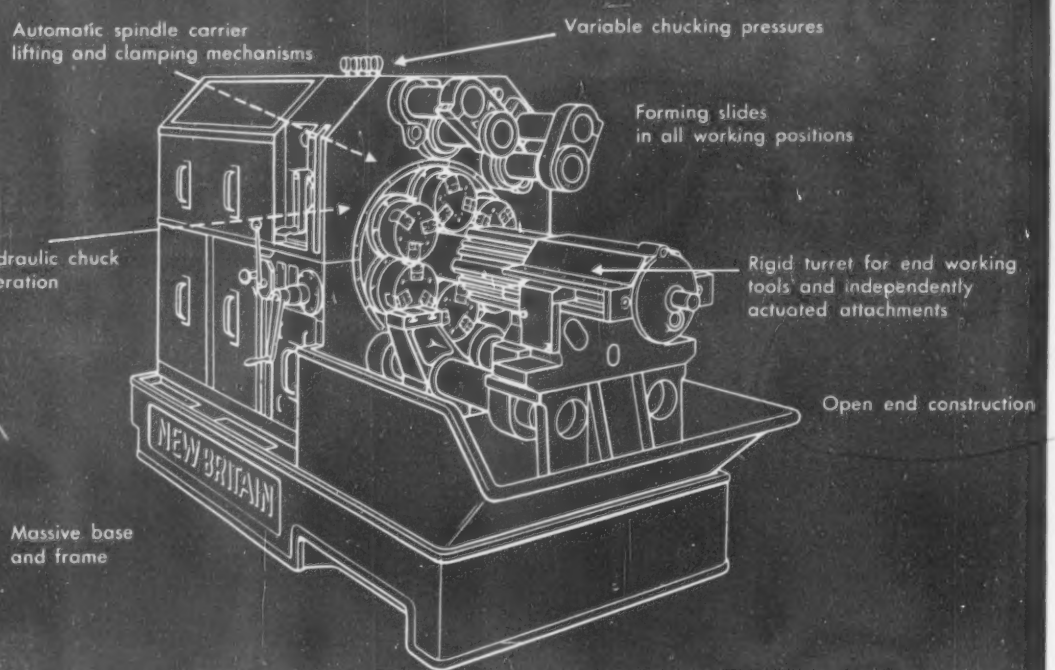
GRAND RAPIDS
GRINDERS

MANUFACTURERS OF SURFACE GRINDERS, CUTTER AND TOOL GRINDERS, TAP AND DRILL GRINDERS

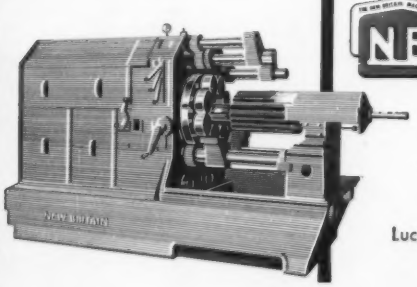
GALLMEYER & LIVINGSTON

New Britain Builds 4, 6 and 8 Spindle Automatic

CHUCKING MACHINES


Automatic spindle carrier lifting and clamping mechanisms
Variable chucking pressures
Forming slides in all working positions
Hydraulic chuck operation
Rigid turret for end working tools and independently actuated attachments
Open end construction
Massive base and frame
NEW BRITAIN

A chucker designed with the extra power and rigidity for multiple operations on forgings and castings, involving both heavy and finishing cuts.



THE NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut

. . . Machines for Making Progress

Automatic Bar and Chucking Machines
Precision Boring Machines
Lucas Horizontal Boring, Drilling and Milling Machines
New Britain +GF+ Copying Lathes

NEW BRITAIN *Automatics*

Bores, mills, drills, planes, shapes, gets precision from over 100 TIMKEN® bearings

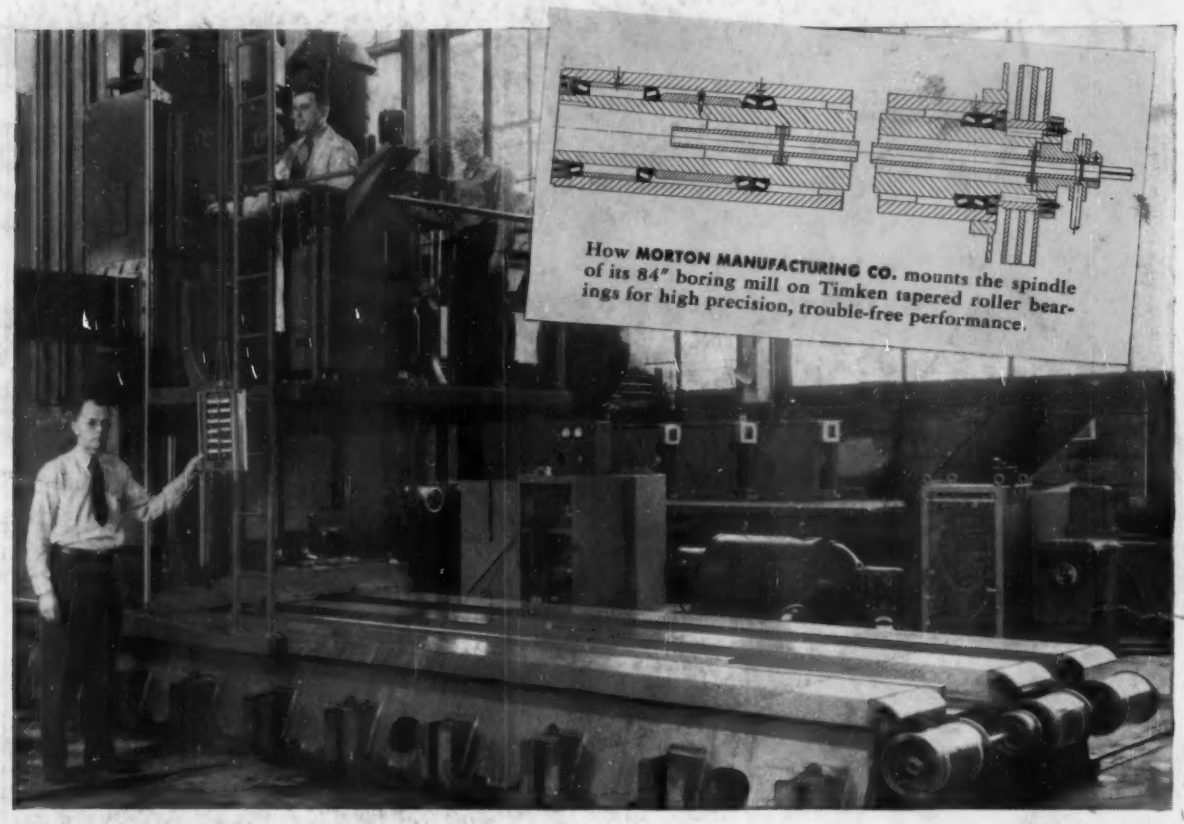
THIS Morton 84" boring mill not only does all the normal operations of boring, milling and drilling, but is fitted with a shaper head so it can do heavy draw-cut or push-cut planing and shaping operations. And it keeps its high precision during them all with more than 100 Timken® tapered roller bearings. They're located in the spindle, saddle, column, feed drive, traverse drive and spindle drive box.

Timken bearings have tapered construction that lets them take both radial and thrust loads, permits pre-loading to any desired degree. Deflection and end-play are minimized. Gears mesh smoothly. Long-lasting accuracy is assured.

The true rolling motion and incredibly smooth surface finish of Timken precision bearings practically eliminate friction. Timken bearings hold housings and shafts concentric, making closures more effective. Lubricant stays in—dirt stays out. Maintenance time and lube costs are cut.

Be sure to specify Timken precision bearings for the machine tools you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **MORTON MANUFACTURING CO.** mounts the spindle of its 84" boring mill on Timken tapered roller bearings for high precision, trouble-free performance.

FINISHED TO CLOSER TOLERANCES

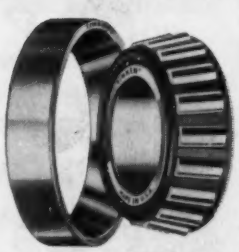
Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at the Timken Company.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →◫←